

Bees, biscuits, crackers and Diaprin packets. Olga Wojtas visits St Andrews University on RAISIN MONDAY and finds out about the unique 'academic family' system at Scotland's most ancient seat of learning (page 10)

When GEORGE SARTON launched the science journal *Isis* in 1911, the "living, passionate history of the mathematical and physical sciences" was still to be written. Jon Turney attends a conference to mark the Belgian scientist's centenary and assesses how far Sartan's dream has become reality (page 11)

Branch-line politics: given Government hostility of public ownership, what is the future for British Rail? Historian Philip Bagwell examines RAILWAYS under the Tories (page 13)

Double-think, thought-crime and now NEW-WRITE. As "Orwell's year" draws to a close, Margaret Sutherland examines a new intellectual vice, increasingly prevalent but difficult to detect or prove (page 15)



ANTHONY GIDDENS

"Men make history but not in circumstances of their own choosing". Dennis Wrong reviews ANTHONY GIDDENS' new *The Constitution of Society*, an account of the geography of structuration (page 16)

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New universities revisited: Sussex
David J. Levy on refugee scholars
Five pages of computer books

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Steady not giddy

Well, all right, it was only one actual Nobel Prize winner plus a few near misses whom Sir Peter Swinnerton-Dyer, chairman of the University Grants Committee, had in mind as potential advisers to the committee on the distribution of the £20m windfall to the universities for laboratories and other scientific equipment. Well, all right, it was as much the idea of Professor John Kingman, chairman of the Science and Engineering Research Council, as of Sir Peter.

Both are excuses in the tradition of the proverbial "well, it's only a very small baby." The plan to go above the heads of the great and good, the people who sit on the UGC and the SERC, and to appeal to the best and the brightest is still an eccentric idea. The fact that it is only a little idea is not really a proper defence. The Swinnerton-Dyer scheme is eccentric for a number of reasons all fairly obvious. First, the best and brightest got where they are in their disciplines by leaving all the chores to the great and the good. Second, Britain has got lots of good scientists but builds too few cars and televisions; so the scientific priorities preferred by the best and the brightest, and for that matter the great and the good, are probably part of the problem not the solution.

Third, Sir Peter is in danger of being accused of shooting first and thinking second. Of course it is refreshing to see a UGC chairman prepared to take a few risks and to generate a bit of excitement. His predecessors were sometimes too sensible and too safe. But the difference between fresh air and hot air does need careful attention. Fourth, the UGC chairman should try to calm the Secretary of State down not to wind him up, especially when he is Sir Keith Joseph.

Fifth, if the UGC is not competent to distribute the tens of millions of equipment grant how is it competent to

distribute the hundreds of millions of recurrent grant? For Sir Peter's maverick behaviour does have the effect however unintentional, of undermining the managerial reputation of the committee he chairs. This is important because the UGC is about to embark on two policies that are both controversial in their intention and complicated in their delivery - a much more selective distribution of the research component of the universities' recurrent grant, and the so-called "switch" from arts to science. Neither can be achieved if the committee's competence is undermined and its chairman gives too strong an impression of believing that an appeal to the best and the brightest, to some "thin, clear stream of excellence", is always an adequate answer.

The difficulty with the first is how to translate a bright idea into effective administrative practice. There is now broad agreement that undifferentiated distribution of the research component of the UGC grant, determined only by quite irrelevant student numbers, is no longer defensible. Most people agree that we must develop a more selective approach, not only to protect the core of research excellence but also to free resources for further expansion and development in areas like continuing education.

But willing the end cannot wish the means, which remain tangled and obscure. The UGC's present answer is to rely on the three working groups established with the vice chancellors and the Advisory Board for the Research Councils. Yet the first of these groups has been given suffocatingly tight deadlines, and the vice chancellors continue to insist that any selectivity must be between rather than within institutions.

A sideways glance at the work of the National Advisory Body shows just how complex is the task of disaggregat-

ing teaching from research expenditure. If the UGC rushes through a botched policy on selectivity, it will lack all credibility as an instrument of allocation: it will be regarded as a fig-leaf for the continued operation of the "old" policy. If it is to avoid an outcome that sets back rather than advances the cause of selectivity, the UGC must proceed by careful, and even boring, stealth - however much this goes against Sir Peter's grain.

The same can be said of the "switch." The UGC must avoid the costly mistakes of the 1960s when buildings and resources were provided for science and technology students who never turned up (or when they did were regarded as second-rate because they had less good A levels). Yet the decline in UGC applications this year is a chilly reminder that there is not an inexhaustible supply of students. Nor is there much sense in the universities adding extra places in politically sexy subjects like electronic engineering if the only effect is to disrupt planning in the polytechnics and colleges - particularly when the disparity in unit costs is taken into account.

In its present exhilarated mood the UGC will not welcome such procrastinating advice. Sir Peter and his colleagues believe that the committee has had a good year; it has raised its visibility and restored its credibility. They fear the consequences of any apparent loss of momentum, particularly at a time when the UGC - NAB rivalry is becoming more intense. Reasonable their concern may be, but the conclusions which they seem to have drawn from them are not. Precisely because the universities are confronted with such a abiding challenge to their values, their practices, their traditions the UGC should offer them steady rather than giddy leadership.

Unions after Scargill

The miners' strike will be a lively issue at the council meeting of the Association of University Teachers in York next month, but in a trivial form. The argument will be about the level and propriety of the AUT's donation to the miners' hardship fund. Many delegates no doubt will be torn between their own personal conviction that the miners must be supported and their uneasy knowledge that most university teachers probably do not share that conviction.

The argument and their anguish are probably irrelevant. After all the donation made by the AUT and any future donations are intended to relieve hardship that may be self-inflicted but is still genuine; it has nothing to do with throwing bricks at policemen. Nor are hundreds of conservatively-inclined AUT members going to resign because the activist minority in their view is indulging in symbolic gestures of solidarity with the miners. So both rhetorical charges of pure towards the point. The real point, the predicament of a small professional trade union in a post-Scargill environment, will probably never get discussed at York.

The predicament can be simply described. The new realism promoted by the former general secretary of the

Trades Union Congress, Mr Len Murray, never took proper root in the trade union movement before it was swept away by the adventurism of Mr Arthur Scargill. For trade unions like the AUT and the National Association of Teachers in Further and Higher Education, that was a tragedy. Both had and have a vested and middle interest in dialogue; both thrive on the corporatist networks which the new realism sought to sustain.

Now that if the miners are defeated is sliding inexorably into when, trade unions may be forced once more to seek a dialogue with the Government - on their knees. Certainly the terms will be much less attractive than those which in 1983 which were so short-sightedly rejected by most trade unions as unequal appeasement. That will be the bitter outcome of Mr Scargill's adventure. Not only will the new realism have suffered a maybe fatal blow, which may not worry the miners but will discredit the best tactic available to unions like the AUT and Natfhe, but the green light will be given for the industrial relations legislation designed to hobble trade unions passed by the present Parliament. They

are likely to have to pay fees and the amount the Government would save is both very small. It is breaking the camel's back because a free education service is an important principle and because of the obvious and realistic fear that once opened the breach can be widened to destructive limits.

Tuition fees for home students have become a dangerous anachronism. They date from a time when parents or students really did have money to spare. Which Sir Keith, may not be unhappy to see return. They have been maintained out of administrative inertia, a mistaken belief in universities and colleges that they enhance institutional independence, and because they provide a link in advance separate from normal recurrent grant paid in instalments.

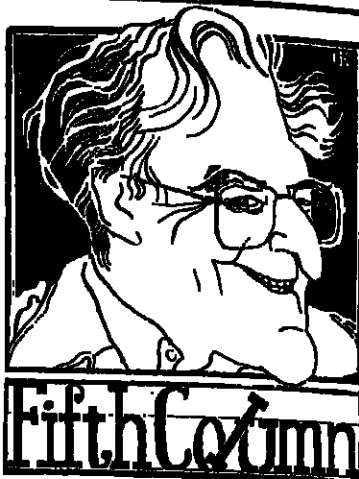
None of these minor advantages has any weight compared to the danger that fees may be manipulated to create at any rate a semi-private system of further and higher education. They should be abolished before they can realise their rank potential.

It was partly with all this knowledge in my mind that I wrote a place for a student magazine in York at the height of the troubles of the late 1960s entitled *The Pond*. That pond was not unlike the great lake at the university. It was the place where the intellectuals flourished at the edge of *Animal Farm*. I have just found my copy of the magazine *York* and am not surprised that most members of the university hadn't the slightest idea what the story was about because I found it difficult myself. As far as I can make out, the tadpoles were the students, the frogs were the academic staff (of course) and the toads were the administration. The Chief Toad in Toad Hall can only have been the vice chancellor in Heslington Hall.

The story was impeccable in its symbolism. The frogs could be seen squatting on water lilies and either singing together or croaking individually. They left the running of the place to the toads who organized lots of meetings for the frogs to croak together until they became exhausted and left the toads to get on with the arrangements. The problem was that no one could be quite sure whether the tadpoles were going to turn into frogs or toads. In the end the pond became such a nuisance that the pigs sent along a detachment of rats to divert the stream that fed the pond so that it all dried up and the tadpoles died.

Now that I have taken on the management of a polytechnic I can't imagine why I was so beastly to the toads. I know that farmers will drive over toads and everything else, like hedgehogs, without compunction whereas I stop for anything in the road to the great annoyance of the drivers behind me. Do take care of the much maligned toads. One might even be a polytechnic director.

Patrick Nuttgens



Fifth Column

It is good news that motorists are going to be warned next year not to run over the toads when they are crossing the road to find a nice dirty old pond in which to spawn. Anything that dissuades us from massacring wild life - in this case amphibians - can only be good; if the Government turns its attention to deer and pheasants and grouse not to mention foxes the scale of slaughter will be much reduced though what the gentry will do with their spare time when there is nothing to kill is rather alarming.

What is surprising to me is that this first enlightened episode should be about toads. I grew up with toads and frogs and spent many hours pushing frogspawn around dark pools. Frogs have always seemed to me attractive little beings, ready to jump at anyone at the slightest tickle and even behaving quite well in someone's pocket if you dropped one shyly in. They always look happy. And they are not alone among the denizens of the pond in being attractive. My problem is the toads.

Literary figures have never liked toads. Shakespeare thought them ugly and venomous and had bits of toads thrown first into the pot by the witches in *Macbeth*. The only writer with a kind word for toads was Kenneth Grahame and he was ambivalent. Mr Toad may have known twice as much as the clever men at Oxford (so he said) but his overweening arrogance and callous disregard for people on the road landed him in jail. The name Toad is not good news to many a motorist. Beware of toads is therefore probably good advice.

It was partly with all this knowledge in my mind that I wrote a place for a student magazine in York at the height of the troubles of the late 1960s entitled *The Pond*. That pond was not unlike the great lake at the university. It was the place where the intellectuals flourished at the edge of *Animal Farm*. I have just found my copy of the magazine *York* and am not surprised that most members of the university hadn't the slightest idea what the story was about because I found it difficult myself. As far as I can make out, the tadpoles were the students, the frogs were the academic staff (of course) and the toads were the administration. The Chief Toad in Toad Hall can only have been the vice chancellor in Heslington Hall.

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NEW UNIVERSITIES



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Natfhe may save miners' courses

The college lecturers' union is trying to rescue the National Union of Mineworkers' trade union education programme.

The NUM has had to abandon or shelve elements of its training for lodge officials and lay officers because of the crippling costs of its 39-week strike and the threats of sequestration of funds. Bursaries of up to £400 to NUM members on a diploma course in trade union studies at the Northern College in Barnsley have been withdrawn. The week courses run by areas have not taken place since the strike started, and the summer school, regarded as the powerhouse for the coal dispute, is also suspended.

Now the National Association of Teachers in Further and Higher Education has offered to provide bursaries out of its educational trust fund for the students still on courses. The union is anxious to enable the four or five remaining students to continue their studies. Two or three have already dropped out.

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Sir Keith backtracks with concession on fees

by David Jobbins

Education Secretary Sir Keith Joseph this week tried to quell a potential revolt among Conservative backbenchers with a limited retreat from his proposals for student grants.

His only concession announced in the Commons on Wednesday, was to lift the threat of tuition fees from high income families, and he warned that the £21m costs of the concession would be achieved by slicing the recently announced increase in science spending in 1985/86 from £14m to £11m.

A further £6m would be saved by cutting back the increase in the equipment grant for the universities from £40m to £34m for 1985/86, although the change for selective assistance would be extended to 1987/88. Yet another

£2m would come through economies in the PICKUP programme, educational research, adult education and the microelectronics programme.

He announced a Government study involving wide consultation for radical changes in the student support system and said that this would include the possibility of loans.

Sir Keith risks continuing dissent not only because of the nature of the economies to pay for the concession but because he intends to press on with his controversial proposals to abolish the £205 a year minimum award and increase the level of parental contributions for middle and upper income earners.

The immediate reaction from Professor John Kingman, chairman of the Science and Engineering Research

Council was: "If Parliament opts to transfer the £16m back to student grants, it would be opting for free access to second-rate universities".

The first signs of a climbdown were detected on Monday when the Secretary of State held his first formal meeting with the National Union of Students. Its president, Mr Phil Woolas, said after the 30-minute meeting that Sir Keith had agreed to consider that parental contributions should be made compulsory, to undertake a review of student grants with full consultation, and to consider reducing the age at which students become independent of their parents from 25.

The outcry at the proposals became more strident as Sir Keith agonised. Already comprising the TUC and its affiliated lecturers' unions and a wide

range of vice chancellors and college principals, it was joined by the Church of England Synod's education board, the Association of Polytechnic Teachers, the vice chancellor of Cambridge University, Professor Sir John Butterfield, and the Association of County Councils.

The Committee of Vice Chancellors and Principals wrote to all MPs conceding that more money for science was desperately needed but regretting the means by which it had been achieved.

Sir Keith was this week taken to task by the chairman of the Commons Select Committee on education, science and the arts, Sir William van Straubenzee over the lack of consultation on the reintroduction of fees. And former Conservative education secretary, Mr Mark Carlisle, reminded Sir Keith of the 1979 commitment to reduce the parental contribution.

Sir Keith told him: "A change in circumstances has made it right for the Government to pursue above all the constraint of public spending in relation to the nation's revenue as a whole." But he acknowledged that 11 months' notice of the changes was "not ideal".

Nothing less than complete withdrawal was likely to make the NUS withdraw its package of protests which will be debated by its conference this weekend. It plans a rent strike in university and college accommodation from the beginning of next term, vigils at Conservative constituency headquarters and demonstrations in Sir Keith's and Mrs Thatcher's constituencies.

under this heading. The extra money for university research grants is split between £2.5m for the SERC, £1.3m for the MRC and £200,000 for the NERC. The SERC also receives the largest capital sum, at £3.3m. As expected, the proposed levy on the SERC and the MRC to create a restructuring fund from within the existing budget, disappears.

The main thrust of the rest of the ABC's report is its determination to move to firmer management of the science budget. On new capital allocations, the report says the board will not earmark the money for specific projects, but effectively tells the councils

to "continue on page 3".

continued on page 3

Students at Salford University students union bar were treated to the sight of a First Division footballer weaving through the tables with his silver tray rather than down the pitch with the ball. It was the first on-the-job training fixture for

Jeff Wealands of Manchester United, and Mike Walsh and John Deary of Blackpool who are following a Business and Technician Education Council post-experience certificate of business administration at Salford College of Technology.

Harrington remark leads to complaint

by Felicity Jones

A student has lodged a complaint with the Polytechnic of North London's governing body which could lead to the suspension and eventual expulsion of Mr Patrick Harrington, the third year philosophy student and National Front organizer.

An interview which Thames Television's six o'clock news held with Mr Harrington last week formed the basis of the complaint brought under the polytechnic's code of discipline.

In the programme, black presenter Mr Mark Wadsworth asked Mr Harrington why he was not prepared to accept home tuition. He replied it was "academic apartheid", and went on to make an offensive remark about the respective rights of black and white citizens in Britain.

Mr James Comer, PNL secretary and clerk to the court of governors said it would take legal advice to see whether Mr Harrington's comments were a breach of the disciplinary code.

Later in the week, Mr Harrington was due to mark an application to the High Court for the sequestration of the polytechnic's assets unless it enabled him to have access to all its facilities.

Ms Tessa Sempik, his solicitor, said her client was not after the polytechnic's assets but the restoration of law and order. The assets include the Holloway Road and Kentish Town buildings but other sites are used under licence.

"This has gone on for nine months and it is his view that if people can be disciplined internally it is better than dragging a few people before the courts," she said.

A second application was also due to be heard from PNL to teach Mr Harrington in private, which could mean at home or on little used premises.

The polytechnic administrators repossessed the main administration and Kentish Town building with police help and forced students out of occupation on late on Tuesday night. A student rally had marched on Monday evening to Pentonville prison where one PNL student is being held following a previous demonstration. Another jailed student is at Letchmere young prisoners unit in Richmond.

Cuts delayed

A reduction in student numbers in architecture is likely to be delayed while the University Grants Committee and the National Advisory Board set up a way of deciding which institutions are affected.

The NAB board decided last week to accept the general thrust of the Escher report which said that 300 places should be shed. This could lead to the closure of up to four out of the 36 schools.

Letters to the editor

Grants proposals mean more inequality

Sir, - The Government proposals on tuition fees and parental contributions in higher education raise many complex issues. The purpose of this letter is merely to point out that as policy they fail to satisfy the basic principle that there should be a rough equality in impact across the country and on the student body.

It should be well known that because of the structure of school and higher education in Scotland, students there usually take a year longer than students elsewhere in the UK to obtain equivalent qualifications, for example, four years to honours as opposed to three.

Thus the changes in parental contribution and particularly the introduction of tuition fees, amounts to a substantial excess charge on Scottish parents and on the parents of students studying in Scotland. The greater the total required contribution the greater

the excess charge. Of course the parent of any student taking an "extended" degree in any field, for example, in engineering, rather than a more basic degree, faces a similar excess charge.

Second, Sir Keith Joseph in his statement said that "the purpose of the extra contribution is... to enable the Government to provide some more badly needed money for basic research in the universities and the research councils". However, many of the students whose parents are to make this extra contribution study in the public sector in the polytechnics in England and the central institutions in Scotland and these will not benefit from this extra money to any significant extent. Thus one group of students and parents (particularly in Scotland) will be effectively subsidizing the quality of the institutions at which another group is studying.

Clearly this latter inequality can only be removed by the development of a research policy which does not discriminate between the university and public sectors.

Yours faithfully,
L. W. BARR,
Paisley College of Technology.

Sir, - I was delighted to read your editorial "The Defence of Grants" (THES, November 16) suggesting that in the long term there should be closer integration of student support with the tax and social security systems.

A broader approach to financing students in post-school education is now desperately needed. As part of that approach, a Basic Income Scheme would make a lot of sense.

Basic incomes would replace the vast majority of means-tested benefits, including student grants, as well as tax reliefs and allowances. They would provide a new unconditional tax free

weekly income for all residents in the UK. As a result, everybody would have some financial assistance towards continuing their education and training.

Part-time working could be linked more readily to part-time education because we would all receive a Basic Income. This would represent a grant for all students, part-time and full-time, and would top up the income of workers who cut their working time in order to pursue their studies.

Basic incomes would be no panacea. They might well need to be supplemented by some form of education and training credits. But they would provide a secure foundation for a comprehensive system of student support in future years.

Yours sincerely,
PETER ASHBY,
Basic Income Research Group,
26 Bedford Square,
London.

Sources of new-write

Sir, - I must confess to a shudder of guilt on reading Margaret Sutherland's article "Tracing the sources of new-write" (THES, November 30). The method she describes is one I have used myself in writing the essays required for continuous assessment by the Open University; and often for the very reason she mentions, that "it would not be possible to express ideas as well as the original writer has done".

However, while this particular aspect of new-write may show a sense of intellectual inferiority on the part of the student which should be discouraged at least, more originality could be used. Surely the style of writing must depend to a large extent on the way in which an essay question is worded, and on the discipline? In the sciences for example, if it is necessary to mention that sensory nerve fibres travel upwards in the spinal column, it serves little purpose to say that they travel in ever-decreasing circles merely for the sake of originality, even if by stating the received wisdom one is using almost exactly the words of a biological text.

It seems to me that the really important point raised by Professor Sutherland is the "hypnotic effect" of writing from an open reference book - it is possible to produce a perfectly adequate piece of work without internalizing very much of the content. At least the swotting necessary for a bookless exam ensures the retention of some facts and ideas for a slightly longer period of time. This seems to be an argument for replacing continuous assessment with more examinations - is that what Professor Sutherland wants?

PAULA LUCAS,
11 Ashridge Way,
Morden, Surrey.

Communicators

Sir, - Dr Briginshaw (THES Letters, November 30) has answered my question in the affirmative. I commented solely on his contention that "... really good communicators are hardly ever found in the ranks of successful researchers..." and was led to ask whether biologists communicate better than mathematicians. In his reply he concentrated entirely on lecturing, presumably to undergraduates. If that is what he meant in his original letter why then did he use the work communicators instead of lecturers?

His last sentence also damages his case because he makes the incorrect assumption that I am hand-waving and have no experience with and have not thought about measuring the effectiveness of communication, in the broadest sense, in higher education. I can assure him, however, that I have been involved with assessing lecturing skills as well as with developmental testing and assessing written and audio-visual materials. I believe, therefore, that I have a reasonable basis for recognizing a good communicator.

I also read mathematics for part of my degree and then made sufficient sense of R. A. Fisher's lectures to do tolerably well in my finals.

DAVID A. JONES,
Department of plant biology and genetics,
University of Hull.

Letters for publication should arrive by Tuesday morning. They should be as short as possible and written on one side of the paper. The editor reserves the right to cut or amend them if necessary.

Gandhi support

Sir, - In my article "India After India" (THES, November 23) I stated that Mrs Gandhi returned to office on a 28 per cent electoral support in the 1979 general elections. I would be grateful if you would permit me a brief clarification of it in order to avoid misunderstanding, especially as I have been critical of her record. Sixty-nine per cent of those eligible to take part voted in the 1979 election, 42 per cent of votes cast (which amounts to under 28 per cent of the total electorate) voted for Congress (I).

T. V. SATHYAMURTHY,
University of York.

Copyright

Sir, - Paul Maren (THES, November 30) clearly is so fortunate as to have no experience of the difficulties which arise when a large group of students are required to read particular papers for tutorials or an essay. One copy of the journal concerned in the library is not enough; a single student borrowing it and keeping it will make the tutorial (or the set of tutorials) a failure. If borrowing the journal is forbidden, 20 students with similar timetables trying to read the same article in a week still makes enough problems to give the weaker brethren an excuse. The making of multiple copies would be the common-sense solution, but for the copyright laws.

Yours faithfully,
D. G. STEPHENSON,
Department of Geology,
University of Keele.

Academic debate

Sir, - Is not the recent discussion in your journal on whether academics enjoy tenure of office or merely believe they do rather academic? If the universities as employers wished to reduce the number of academic staff in their employment by say 10 per cent or 20 per cent surely all they would have to do is to point to the long-standing breach of contract on the part of some of their employees.

Those who are employed to do research (as I take it all university lecturers are) but do not do so may have a job for life but cannot be said to be doing their jobs. And to ask the majority of lecturers to act in solidarity to protect this minority while younger able people remain jobless is to sacrifice the nominal academic while sacrificing the real article - a sobering thought even without the recent news of the discontinuance of the "new blood" scheme.

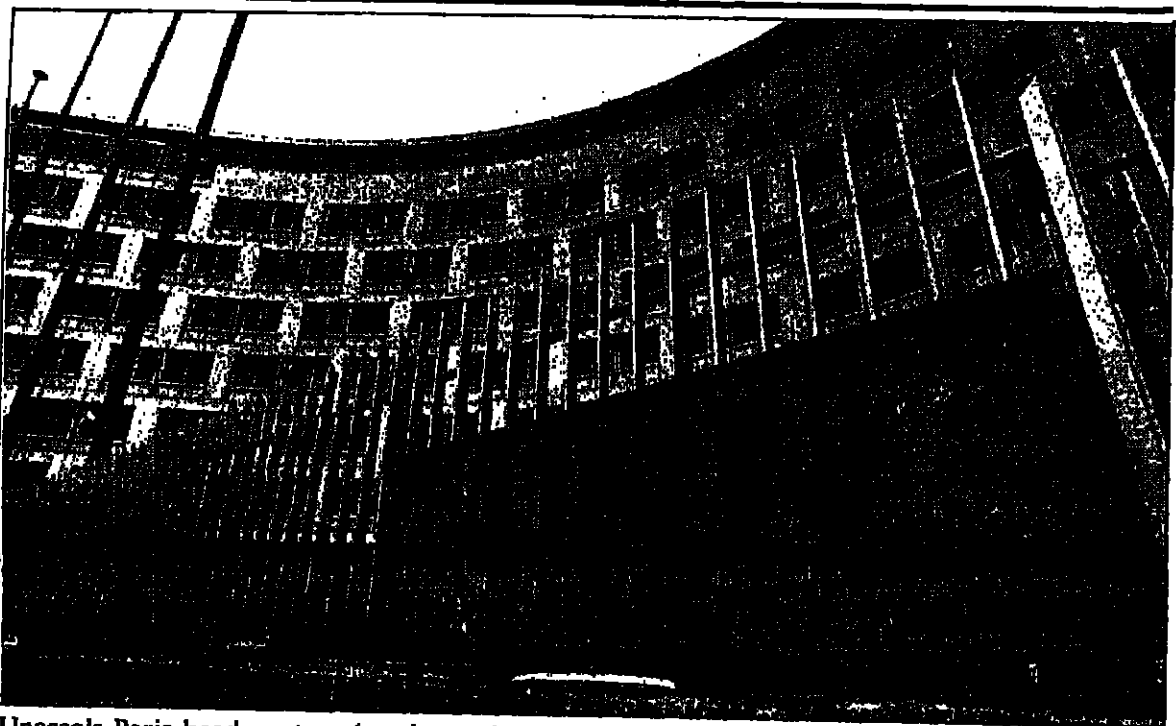
Yours faithfully,
TARIQ MODDOD,
University College of Swansea.

AUT donation

Sir, - Your suggestion that "hundreds" of Association of University Teachers' members would not resign from the association over the donation to the miners is not borne out by the facts. This association has already lost well over the small percentage which your vague figure envisaged as the national loss; and I am aware that some other local associations have suffered much more serious losses. Many more members will resign next year if such acts of folly by the AUT continue.

The ransom there has not been a mass walk-out is that most members did not even realize that the donation had been made! To counter all this, I have spent more time and energy than I can properly spare in persuading people to stay in for a while in the hope that sanity will prevail in future.

Yours etc.,
JOHN WATSON,
Hon. Secretary,
Oxford Association of University Teachers.



Unesco's Paris headquarters: 'much may be wrong with its work'

Unesco profile

Sir, - Given the recent adverse publicity, it is difficult not to be concerned about Unesco's large and seemingly excessive bureaucracy as well as its growing political profile. However, this should not mean that the United Kingdom's continued involvement is automatically in question.

Now more than ever in the history of the organization the voice of the academic community needs to pre-

sent reasoned argument to underpin the development of a visionary concept. It has to be remembered that Unesco's record of achievement in areas such as the promotion of literacy and the establishment of truly worldwide dialogue is too important to be overlooked in the interests of short-term political or economic expediency.

As an occasional Unesco consultant I am conscious that much may be wrong with the work of the Paris headquarters. However, I am equally sure that major reforms are

being actively considered. Many interests acknowledge that the organization must regain its early idealism and everyday usefulness. Playing a part in this demanding process will require increased international concern and constructive endeavour rather than mere sabre rattling or "cut and run" defeatism.

Yours faithfully,
DR JOHN L. TAYLOR,
Principal,
Bretton Hall College of Higher Education, Wakefield, West Yorks.

Personal view

Sir, - The recent review of my *Levels of Personality* (THES, November 9) makes two criticisms.

On the first - origin of the correlation coefficient - I stand corrected.

On the second - consent and paedophilia - I think your reviewer misquotes me, so, given the sensitivity of the issue, I'd like to correct him. He says I say "the true paedophile tends to have the child's consent". What I

actually said was "the true paedophile tends to have the consent of the child, as evidenced by the child visiting the paedophile's home".

The distinction I was trying to draw was between an actual assault and an act the child is prepared to make a journey to engage in. It is now generally known that many sexual contacts between adults and children don't involve force or obvious coercion and that the child often appears willing at least to the extent of allowing repeated sexual contacts, or of going to the paedophile's home.

What I certainly wasn't implying was that children give their genuine consent, because I share the general opinion that children can't consent to what they don't understand. On the previous page I pointed to the circularity of paedophile arguments that paedophilia implies a consenting relationship because any contact that isn't consenting isn't paedophilia.

Yours sincerely,
MARK COOK,
Department of psychology,
University College of Swansea.

Funds for few

Sir, - Why is it that in Dr Robin Nicholson's evidence to the House of Commons Select Committee on Education, Science and the Arts the models held up for us are Canada, Australia, Sweden and the Netherlands - all countries with much smaller populations - rather than France, Germany or Japan? Have we given up any attempt to compete in that league? Japan has brilliantly demonstrated the virtues of selectivity in funding research, but it has been in the context of an overall rapid growth including for example particle accelerators. None of these countries, large or small, has opted out of a whole area of research in

which they have invested heavily. No amount of selectivity will allow us to go on being competitive in a few chosen fields if the wider scientific base is crumbling.

There is grave danger that irreparable damage will be done to science in this country by a mistaken belief that selectivity can substitute for increased funding. Any choice made will almost surely prove to be wrong - particularly if it is made by a committee in a panic. What is proposed is that we treat a famine by amputating limbs.

Yours faithfully,
T. W. B. KIBBLE,
Professor of theoretical physics,
Imperial College of Science and Technology, London.

In the field

Sir, - The Economic and Social Research Council has recently provided funds for a regular seminar on field research for social anthropologists, sociologists, criminologists, educationalists and other researchers who use qualitative methods of social investigation. If you would like to be included on the mailing list for this seminar, please write to Dr Bob Burgess, Department of Sociology, University of Warwick, Coventry, CV4 7AL.

Yours faithfully,
R. G. BURGESS,
University of Warwick.

Skills agency must get public funds

by John O'Leary

A successful launch for the Confederation of British Industry's new skills agency will depend on Government or state agencies matching industrial funding for new projects.

Two of the key initiatives likely to be undertaken, an expanded open learning scheme for information technology and new information technology training companies, will not get off the ground without commitment of public funds.

The agency, which will be run by the CBI's education foundation, is the product of discussion in the committee set up under Mr John Butcher, under-secretary at the Department of Trade and Industry, to try to solve skill shortages.

More than 30 companies have already pledged support for the initiative - including GEC, Plessey, IBM, British Telecom, British Aerospace and BP. But they are pressing in the committee for firm backing from the Government.

The agency will be launched in the new year, probably around the time the Butcher committee produces a third and final report, now due at the end of January. The third report is intended to summarize progress made and report what the committee has learned. A second report in a few

weeks, originally intended to cover this ground, will now only deal with technicians.

One strong possibility for the skills agency is coordination and expansion of a distance learning project for information technology set up under the Alvey programme for advanced computer research. Talks are in progress between Alvey and the Manpower Services Commission to secure MSC cash for a wider range of courses, to be developed with the Open University. The skills agency would have to channel industry funds into the project.

Several companies are considering helping to set up information technology training companies, which would have capital from companies, higher education institutions and the Government, and the new agency will also seek to act as coordinator for these schemes.

The second Butcher report will argue that the main problem is retraining and updating technicians, rather than boosting numbers. There are some shortages, more acute in the south-east of England, but the committee is concerned about enhancing the skills of those already employed. Members have discussed a "transfer fee" scheme to deter companies from poaching staff who have just been on training courses paid for by their existing employer.

Middlesex Poly requests university name change

by Patricia Santinelli

Middlesex Polytechnic is to ask its maintaining authority, the joint local authority education committee for approval to change its name to Middlesex University.

This follows overwhelming support from the polytechnic's academic board for a change of title. The board preferred the title of Middlesex University rather than Middlesex Polytechnic University which it felt would be confusing and not address the matter at issue.

The change of title is to be discussed by the committee on January 25 and the polytechnic's governors in mid-January.

Dr Raymond Rickett, the polytechnic director, said that if the change of name went ahead it would help to end a situation whereby the polytechnic and its students had been unjustly rated below university and their students.

"Polytechnic degrees are subject to rigid external validation to ensure that they are the equal of university de-

grees. Using university in our name will help to drive this home," Dr Rickett said. "The overriding reason for seeking this change is to make sure that our students gain fair and equal opportunities when they seek employment."

The Department of Education and Science says that the institution can change its title to Middlesex University but officially it will continue to be a polytechnic. If however Middlesex sought to recruit university students, it would require a Royal Charter or an Act of Parliament.

Two of the polytechnic's faculty boards - science and engineering and business studies and management - voted last week for the change, as first proposed by the polytechnic directorate. Another two, humanities and social science have rejected it.

A survey carried out among the polytechnic's humanities staff showed almost no support - 4 per cent of respondents - for the proposed new name unless this meant the polytechnic's level of funding was to be increased.



London MP slams ILEA disruption

Government proposals for breaking up the Inner London Education Authority are attacked by a London MP for causing disruption to students and pupils, in a motion expected to be debated today.

Mr Tom Cox, Labour MP for Tottenham, is also calling on the Government to launch a national investigation into the inadequacy of the education service in many parts of the country.

Mr Cox says he has called for a debate by the House of Commons because the whole future of education and education standards in inner London were at risk.

"I and other London MPs want to highlight the quality of the appalling record of many education authorities throughout the country," Mr Cox says.

Poly lecturer gets £10,000

A lecturer who claimed she was hounded out of her job by left-wing colleagues has received a £10,000 out-of-court settlement.

Miss Ellen Geach, former head of business studies, had alleged constructive dismissal against her former employer, the Polytechnic of the South Bank. An industrial tribunal hearing had been due to start this week.



Double kick time: identical twins Tessa (left) and Deborah Vale have just graduated from Kent University with degrees in the performing arts. They decided from an early age to take up a theatrical career, encouraged by their mother, an actress, and script editor father. They took their degrees at Nonington College, which is affiliated to Kent and now plan to work together as a singing duo.

Oxbridge set for double entry system

Oxford and Cambridge are now set on operating two different types of admissions procedures, much to the consternation of the very schools they are trying to help by simplifying the process.

Cambridge University colleges have just agreed to develop a sixth term entrance examination, modelled on the current S (scholarship) level, to be taken alongside A levels and based on the common core of A level syllabuses.

This follows the results of a questionnaire earlier this year which revealed a majority of secondary schools in favour of the sixth term examination, rather than continuing with the fourth term examination as Oxford colleges have decided to do.

Both universities will also be offering entry through conditional and "unconditional" offers, the former based on prescribed A level results, but the latter lodged more on potential and interview performance with the requirement of just two A level passes.

Confusion will arise when sixth-formers try and decide which university to aim at and which entry route to try: interviews at either university, or to wait until A levels for a shot at the new Cambridge examination. It seems inevitable that in future candidates will not be able to apply for both universities at the same time.

The reformed Oxford system comes into effect next October when applicants either take the fourth-term examination or apply at the same time for an offer. The Cambridge system would not start until 1986, when the entry for 1987 would have to wait for the summer that year to take its entrance examination, or apply early for an offer.

Several obstacles still remain before Cambridge finalises its system: subject boards need to devise draft syllabuses, a green light is needed from other universities who will have to wait until Cambridge has processed its applications first; and agreement will have to be secured from the Universities Central Council on Admissions.

Most schools however seem to favour the Cambridge approach. Mr Robinson Fisher, deputy secretary of the Headmasters' Conference of private schools and the Secondary Heads Association said the hope now was that Oxford would fall into line with Cambridge.

Union leaders face joint review criticism

by David Jobbins

Union leaders backing a joint review of lecturers' pay and conditions are expected to come under fire from their critics tomorrow as the college lecturers' union fixes the main aims of its 1985 salary claim.

Some leading figures in the union believe that the existing agreements on important areas such as class contact hours and remission from teaching may be at risk if the lecturers go along with the proposal from the local authority employers for a joint review.

They will try to force the issue around a vote which if carried will effectively block the National Association of Teachers in Further and Higher Education from taking part.

The review was proposed by Councillor John Pearman, leader of the management panel on the Burnham further education committee late last month, and union negotiators waited to see a transcript of his remarks before firmly committing themselves.

Now that officials have had the chance to examine the proposals they feel the union should agree to take part, largely because it will offer the prospect of tackling the grading of courses issue and a way around the problems caused by the promotion blockage at the top of the lecturer's scale. It has yet to be considered by the executive.

Mr David Triesman, Natfhe's negotiating secretary, said: "We have a number of structural claims outstanding of considerable detail, and they will require careful discussion with the employers. This review may well provide a forum for those discussions."

"No union will go in to hear things, good and bad, from the other side and expect meekly to accept the bad points. When these come up for consideration, they will simply be rejected if they are unacceptable."

At the last Burnham further education committee, Mr Pearman said that

Scientists angry with Sir Keith

continued from front page

what to spend it on, identifying projects "to be seen as indicative of the kind of area where we would like to see money spent".

Further indications of the move toward flexibility are the board's retention of £5m from the 1986/87 allocations, which individual councils will be invited to bid for; and the allocation of £200,000 next year to strengthen the ABCRC secretariat. The need for these moves is shown by the estimate that the SERC's new money for grants will merely stabilize the success rate of

"alpha" applications at 70-75 per cent.

The board says that enhancing flexibility should feature prominently in councils' corporate plans and it urges they keep at least 3 per cent of their budgets free for new opportunities.

In addition, the report lists a series of new initiatives on the ABCRC agenda for 1985. These include a consideration of areas where Britain should maintain a major scientific presence, and those with a "care and maintenance" role; a review of areas which cross research council boundaries; and the prospects for developing joint research programmes.

Returning to his theme of social sciences versus the physical sciences, Sir James said that the problem was exacerbated by the vastly greater volume of expenditure on research in the latter.

It was almost impossible for research to have an impact on policy when the Government had already set a programme in train.

A far more effective method would be for educational researchers to influence policymakers before they got into positions of responsibility. Sir James pointed out that much educational research could achieve greater impact

if it stopped lumping everything under the heading of research. "Most of what is perpetuated under that heading is development; an honourable and definite term; some of it is survey and only a very little is research in the generally accepted sense," he said.

DON'S DIARY

SATURDAY

Early morning shuttle to Heathrow requires transfer to accommodate record number of passengers. Are they seriously proposing after hour's delay to serve 353 eggs and bacon for breakfast? Transfer to 747 for 200-class flight to Boston, when they strap you into your seat with no room to flex a muscle and proceed to stuff you with food. Jumbo taxis like a centipede with flexible fuselage, and after a noticeably extended take-off run unsticks to climb away with marked yaw. Evidently the captain's boots are hurting him. "Welcome to BA's flight to Chicago - sorry, that was yesterday. Philadelphia, BOSTON, BOSTON. I had confirmed the night before that it was possible to route our baggage direct from Edinburgh to Boston: 'Aye,' said a British Airways spokesman, 'you'll no see your baggage at Heathrow. In fact, you'll be lucky to see it again anywhere...' His humour proved prophetic.

SUNDAY

Language problems begin in the breakfast room. Over-easy eggs and homefries translates as fried eggs turned over but still soft, with potato, hard, grey and greasy. Already suffering from lack of fresh vegetables, even a plate of bashed neeps. Evening meal is Italian, and excellent, though two courses and a bottle of cheap wine for two at \$70 requires some mental adjustment, especially since this restaurant is rated in the guide as "moderately" priced. It is served by a loquacious college boy who recommends the "awesome spy-nach", which we decline, fearing instant transmutation into Popeye clones. Temperature 74° F, beginning to suffer from lack of change of winter clothing. BA unmoved - they don't have PhDs in their response to further inquiries, which suggests some inflation in the qualifications required to read a luggage label.

MONDAY thru THURSDAY

(... As they say in the US of A.) Finally reunited with belongings, we spend four days visiting New England campuses - Harvard, Brandeis, Amherst, Smith, Trinity and Wesleyan. These are all colleges from which Edinburgh has drawn Junior Year Abroad students, and part of our purpose is to receive feedback and to foster better-informed relations with overseas coordinators at these institutions. There may be good academic reasons for encouraging JYA programmes, but a succession of representatives from British universities anxious to attract overseas fee income makes us feel a bit like encyclopedia salesmen. The United States is noted for its hospitality and formulate courtesy: "How are you?" "Enjoy your meal." "Excuse me?" "Have a nice day, evening, night?" "You're welcome." Service is occasionally suspect. Waited an hour without success for a taxi outside the Holiday Inn at Hartford, CT, in the company of a man from Alabama who was suffering from nosebleed and was late getting to the airport to meet his wife. "Ma wife'll kill me," he moaned, as we tried to recall which comedy film we had seen his prototype in.

FRIDAY thru SUNDAY

Arrive New York, where the prices rival the height of the skyline. Hotel glitters on the ground floor, but is faded and fading above with decidedly antiquated fittings for \$85 a night. Out in the city, food assaults the

visitor on all sides, with the smell of hot-dogs and roast chestnuts on every street corner. Police juggle with their batons, guns, conspicuous beneath their leather jackets. Dozens of street traders with trinkets spread over the sidewalk. In Central Park horses and trunks convey sight-seers, while cyclists, joggers and roller-skaters, all tuned in to their head-sets, speed by. They include building, elderly gentlemen similarly equipped, who presumably, after their moment of exhilaration, return to their city offices to manipulate the commercial fortunes of the world. Has this nation no sense of propriety?

MONDAY

By Amtrak to Philadelphia, and the election looms prominent. Of the 50 million plus Reagan voters, we have so far met only one, a barman in New York. The level of serious debate on television is remarkably low, as is the coverage of world news. Events in India only momentarily disrupt the parade of pious affairs. The outcome of the presidential contest is a foregone conclusion and greater concern is expressed regarding the subsequent nominations to the Supreme Court.

Edinburgh enjoys an exchange relationship with Pennsylvania which is extremely popular with students; it is also one of the few American universities (with Harvard) which teachers may own suspect of European archaeology. Lecture on aerial archaeology and the Scottish Iron Age to a small but appreciative audience at the university museum.

Washington DC and election day. Productive discussions, and exemplary hospitality at Georgetown University. Georgetown is a Jesuit foundation which includes such public figures as Henry Kissinger (sic) and Jeanne Kirkpatrick among its faculty, and which carries sufficient clout that the flight-path out of the national airport was allegedly diverted because the noise disturbed the wife of a former senior member. We are entrusted to a student on a work-study programme who conducted us on a guided tour of the campus, which was both well-informed and apparently unimpressed. Should we consider introducing work-study opportunities in Britain to compensate for the reduction in effective grant support for student fees and maintenance?

WEDNESDAY

The sun shines brightly on Reagan's America, and the bible-puncher on the steps of the Capitol praises God for a president who is strong and who condemns communists and pervers. "I'm sure you agree, because you look like decent folk." Asked a soldier at Fort Wade for directions to the two lives memorial, the marine corps' national monument: "Uh, yessir... uh... I know where it is, but... uh... I can't rightly tell you how I got there," he replied, without explaining whether his problem was risk to security, acute contraction of the larynx, or disorientation induced by a peaked hat which restricted his vision above the knee-caps.

We try his companion. "First left, hundred yards on the right," came the prompt response, which proves that, like BA, they don't require PhDs for entry into the marines either.

At Arlington, nearby the torch still burns on the grave of JFK, even though for the moment the custodians may be snake-charmers and tub-thumpers.

Dennis W. Harding

The author is Abercromby professor of archaeology and dean of arts at the University of Edinburgh.

Experts take NAB to task

by John O'Leary

Lending figures both inside and outside the National Advisory Body have expressed doubts about the way the organization is developing. In a series of papers published this week.

In an edition of *Higher Education Review* devoted to the proceedings of a seminar held earlier in the year, the NAB is taken to task for the way in which it conducted last year's planning exercise and its methods of preserving the quality of courses.

Miss Sheila Browne, principal of Newnham College, Cambridge, and senior chief inspector at the time of the NAB's establishment, said that the body could have little useful future unless it concentrated on quality. But it could not do so with its recent methods and would need active support from central Government through clearer policy statements.

"Time and again, one is driven back to the conviction that the NAB might be better to seek to establish, on fairly common sense grounds, a practical network of viable institutions and then leave it to the management (local authority and institutional), the professional agencies and HMI to deliver the required goods."

"Clear and realistic messages seem to be the first requisite - and one has to

question whether a NAB of the present kind can deliver them: as far as quality is concerned, it looked, by the end of the last academic year, more like insulation than an effective conductor - and at times one could see it becoming an inflated and potentially flammable buffer," she said.

Dr Peter Knight, deputy director of Lancashire Polytechnic and a member of the NAB board, deemed the 1984-85 planning exercise a failure and considered it poorly conducted. The exercise had been launched too hurriedly and without the necessary predetermined policy guidelines. Instead, policies emerged in mid-stream and some were modified at a later stage, while others remained obscure.

In particular, Dr Knight argued that the NAB should have concentrated on planning provision in the major institutions and not dissipated its efforts by including every college involved in higher education. A similar effect could have been achieved by modifying existing funding formulae, rather than creating a new body, he maintained.

Mr Stephen Jones, deputy provost of City Polytechnic and a former assistant secretary at the Department of Education and Science, agreed that a more selective approach by the NAB might have been preferable, confer-

ring academic credibility. He also revealed some of the background to the decision to establish the NAB.

Previous plans to take the polytechnics and some colleges out of local authority control had been prompted in part by signals from Conservative councillors in the counties "to the effect that they would like nothing better than to be rid of their polytechnics, which they had come to regard as over-ambitious cuckoos in the local authority nest".

Although the refusal of those members to state their views publicly made some retreat inevitable, it was decided to retain the plan as one option as a weapon in the Government's bargaining armoury. However, the ministerial reshuffle of September 1981 brought a change of approach and the earlier attempts to reach an accommodation with the local authorities were resumed, eventually producing the NAB.

Professor Keith Clayton, a former member of the NAB board as deputy chairman of the University Grants Committee, argued that the NAB should not have been restricted to England and called for a body covering the whole of Britain.

Higher Education Review, autumn 1984, 34 Sandilands, Croydon CR0 5DB.

Principal warns of cuts discrimination

by Olga Wojtas
Scottish Correspondent

The principal of Glasgow University has warned that girls hoping to come to university could be worse hit than boys by grants cuts and tuition fees.

Sir Alwyn Williams, speaking at a graduation ceremony, said that there was a tendency to favour sons rather than daughters if the cost of supporting both at university proved too burdensome. This prejudice would be reinforced by the Government's financial moves.

"Even if the Government has lost its sense of priorities, hard pressed parents must continue to make even greater sacrifices to ensure the defeat of sex discrimination in education," said Sir Alwyn.

The principal said much had been made in the statistical battles between the universities and government about the increasing number of female students. But the national trend had not yet overtaken the level of about 40 per cent which had been sustained at Glasgow for the past decade.

Sir Alwyn said he would not be

surprised if this ratio of around two women to three men students proved to be a national sticking point beyond which there would be no further shift towards equal representation in the immediate future.

"There is, of course, no valid reason why women students should remain in the minority, nationally or locally," said the principal. "The present inequality is the outcome of greater constraints on the education opportunities for girls than for boys."

"These constraints continued to be imposed by social prejudices, which exerted undue influence throughout the school system. But the country needed all the well trained intellectual resources it could get, said Sir Alwyn.

"It can no longer afford to overlook the extra professional and industrial expertise that would be at its disposal if equal representation of the sexes were achieved among students throughout the entire tertiary educational system," he said.

"Steps should now be taken specifically to recruit women students to redress an imbalance which no longer exists in the United States of France."

Graduates get business cash

The Government is to offer 40 graduates £4,000 each plus training and accommodation to start their own businesses.

The Graduate Enterprise Programme, which is being financed by the Manpower Services Commission, was launched this week. It will start in July and run for 18 months at the Cranfield Institute of Management, which is devising the training for the scheme.

The programme is also being backed by the National Westminster Bank, the British Petroleum Company, and consultants Arthur Andersen and Co, which will help the successful graduates get their businesses going.

Professor Paul Barnes, National Westminster Bank professor of small business at Cranfield, said that the scheme would concentrate particularly on selling skills. Graduates were weak in this field, as they were bad at selling themselves let alone their product or service.

The financial help being offered by the MSC will include £1,200 for a market research budget which must be justified, and a four-month training allowance of at least £40 per week. Graduates may qualify for £40 a week for a year under the Enterprise Allowance Programme.

Concern over dangers of central control

A call for alertness and sensitivity in monitoring the potential dangers of central control by the Department of Education and Science has come from Professor Denis Lawton, director of the London University Institute of Education.

Professor Lawton's views expressed in the Institute's Bedford Papers are basically an update of fears he voiced both in 1978 and 1980 about the DES increasing drift towards a more centralist and dirigist stance.

"On reflecting I do not think that I exaggerated the DES drift, but perhaps I underestimated the part played by some individuals. However, the reasons for an increase in central control are not simply the result of a single personality; they are much more complex," Professor Lawton says.

alarmed by the bureaucratic, technicist trend that was developing, although this might have been moderated slightly in recent years, not least by some powerful voices in Her Majesty's Inspectorate. In particular the Assessment of Performance Unit had not turned out as badly as he feared, but in other respects the emphasis on objectives, tests and measurements as accountability is disturbing.

"Thirdly, the secrecy and manipulation charge I made, I think that there has been some improvement here and the DES is now somewhat more open, for example the decision to publish HMI reports. There is no reason to be complacent but secrecy is no longer the major problem," he says.

But he points out that it is no longer satisfactory to speak of the DES as a monolithic central authority in education.

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£14m boost for Scots technology

by Olga Wojtas
Scottish Correspondent

The Scottish Office has committed itself to a £14m boost to central institution engineering and technology courses, to be funded through the savings culled from grants cuts and tuition fees.

The Scottish Office minister for industry and education, Mr Allan Stewart, made it clear that the plan to increase the annual output of technological graduates from 500 to 800 by the end of the decade would go ahead, even if the Conservative backbench revolt against grants cuts was successful.

The main beneficiaries of the £14m, which is to be distributed over three years, are likely to be Robert Gordon's Institute of Technology, and Paisley and Dunfermline colleges of technology, with Napier College and Glasgow College of Technology eligible for funding from next session, after they join the central institution sector.

Mr Stewart said the extra student places would be weighted towards electrical and electronic engineering and related disciplines, and other information technology skills. The money would be allocated following discussion between the Scottish Education Department, the Industry Department for Scotland, and individual institutions.

The increased output of graduates would help the country's economic recovery and enable young people to improve their job prospects, said Mr Stewart. Scotland had firmly established its reputation as Silicon Glen, and the key to its continued success would be skilled manpower. Mr Stewart added that Scotland produced more graduates per head than any other western European country.

"I hope that both present and potential industrial investors will regard this initiative as proof of the Government's intention that the higher education system in Scotland will play its full part in avoiding manpower shortages in particular high technology skills," said Mr Stewart.

But he stressed that industry must also play its part, and praised a new project at Paisley College, offering companies short training courses in electronic engineering.

Paisley's new Microelectronics Quality Assurance Laboratory is being funded jointly by the SED, the Scottish Development Agency, and a number of electronics companies including IBM, Ferranti and Hewlett Packard.

The project will provide conversion courses for experienced electronics engineers, and the college hopes to take in £250,000 in fees during the first three years, after which the scheme is expected to be self-financing.

Dons oppose tenure proposals

Cambridge dons are strongly opposed to the university's plan to draw up its own procedures to allow for compulsory redundancy of tenured staff if necessary in a financial emergency.

In a Senate House debate, all seven speakers, including several local officers of the Association of University Teachers, criticized the plans. They accused the university's central authorities of bowing to current political pressure from the Government.

The council of the university's senate had recommended that the procedures should be drawn up to stave off the threat of outside commissioners appointed by Sir Keith Joseph, the Secretary of State for Education, interfering to try and end tenure.

Dr Gerald Grace of Wolfson College, an AUT committee member, said to restructure the current rules governing tenure was to connive at the weakening of a principle of academic tenure. "It is to be party to a reduction

of the university's significance in national life." He said there was no reason to believe that "the enemies of academic freedom" were now so numerous as to make Government interference on tenure inevitable.

Dr Henry Phillips of Emmanuel College, president of the local AUT said the move was misguided as a tactic, and demonstrated Cambridge's readiness to comply with Sir Keith's wishes in advance of any legislation. "We shall in other words have precipitately accepted defeat," he said.

Mrs Cathie Marsh of Newnham College noted that in the past three years there had already been a slight fall in the number of untenured posts in the university. At present some 43 per cent of 1,580 Cambridge academics, including assistant lecturers, research fellows, demonstrators, and directors, lack tenure, the highest proportion of untenured staff in any university.

The debate was wound up by Mr Stephen Bragg, former vice-chancellor of Brunel University, now a fellow of Wolfson College, who urged the senate council to find alternative ways of introducing staffing flexibility without reducing tenure. He suggested the option of offering financial inducements for temporary redeployment.

The criticisms are being studied by the senate council and the general board of the faculties with a response expected next week. If the council decides to stick to its guns there will be a ballot of all dons on whether to proceed.

● Oxford University dons have been reminded that January 3 is the closing date for comments on its proposals on tenure, published in the *Gazette* in the summer. Oxford has also suggested reforms to allow for staff reductions in a "sensible and orderly fashion" if financial exigency is deemed necessary.

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Television credit scheme is launched

An ambitious credit accumulation scheme involving Channel Four and Yorkshire Television, the Business and Technician Education Council and the National Extension College, will reach domestic screens in the new year opening up new opportunities for home study.

A series of 20 broadcasts, *A Question of Economics*, researched by presenter Peter Donaldson of Ruskin College, will form the heart of a BTEC post-experience unit.

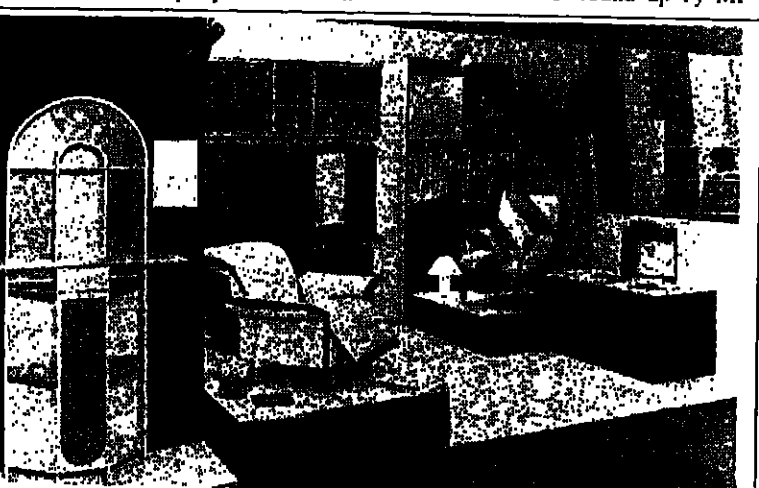
The unit is one of the modules in the council's certificate of business administration programme for which assessment will be based upon assignments completed during the course.

Courses will be run in further education colleges, management centres, adult education institutes and by trade unions for adults who have had previous experience in business or industry.

For those students who are unable to enrol at an institution, the NEC is providing a learning pack along with study lines for self-tuition which is tied into a new Penguin book also written by Dr Donaldson.

Ms Naomi Sargent, Channel Four's senior commissioning editor for education, said: "This is our answer to the Mumpower Services Commission's Open Tech programme but on a truly national scale."

It is expected that if successful, the four-way pilot project will lead to further collaboration on BTEC accredited courses. In its guidelines for the unit, BTEC says: "It is hoped that in providing this unit, centres will be able to break down traditional barriers."



Design for living: Leicester Polytechnic's furniture design students' display has won them the 1984 DIA Gordon Russell Award at the Style 84 exhibition in London. This new national design award was presented by Secretary of State for the Environment, Mr Patrick Jenkin, and was accepted by Christine Haddon, 21, on behalf of the polytechnic.

Manchester Poly praised

The Council for National Academic Awards - has praised - Manchester Polytechnic for its policy and institutional development, quality control and research.

The council's report on its quinquennial review of the polytechnic, which took place earlier this year, says that Manchester was a different institution from the one which caused CNAAs some concern at its last 1978 visit.

"Given the size, complexity and declining resources, and in recent years, with the need to assimilate a further merger (with the City of Manchester College of Higher Education) the achievements were a credit to all concerned."

The report picks out the present effectiveness of the polytechnic's academic board and faculty boards, which had worried the council five years ago. The CNAAs were impressed with the high quality of academic administration, and with the polytechnic's support for staff development, although some faculty boards were developing and influencing departments more effectively than others.

There were also resources problems: in some areas further cuts could not be made without loss of quality, the report says. In particular library and computing resources were needed: staffing levels in computing services were low and computer provision was giving the polytechnic concern.

Europe 'failing to compete'

by Jon Turney
Science Correspondent

The threat of economic domination by the United States and Japan may be the stimulus for development of a truly European science policy, according to Dr John Goormaghtigh, secretary general of the Strasbourg-based European Science Foundation.

In a lecture last week at the University of Kent, Dr Goormaghtigh said the countries of the European Community were quite capable of competing with the rest of the industrialized world in science if only they could cooperate. He estimated that in 1981 the governments of the nine major EEC countries spent \$20 billion on research and development, with West Germany contributing around a third of this, and France and Britain about a quarter each.

The total meant that western Europe's total effort was of the same order as that in the US and a lot bigger than Japan's. But Europe had failed to capitalize on this, because of poor mobility of scientists between countries and disciplines, weak links between industry and academic laboratories, and a rigid, hierarchical academic community.

But Europe's main weakness remained national rivalry. "So much effort is wasted by useless duplication and sterile rivalries that it seems difficult to understand why the founders of the European movement did not give priority to the harmonization of science policies, to the promotion of co-operation among scholars, scientists and technicians and to structuring research," said Dr Goormaghtigh.

He concluded that there was no organization devoted to an overall European research and development policy because the political will did not exist, but the current economic position might finally produce moves in this direction.

A separate European proposal, for a European academy of science, received a lukewarm response last week from Sir Andrew Huxley in his presidential address to the Royal Society.

Sir Andrew gave less attention to the academy than to a strong defence of Britain's membership of the European Nuclear Research Centre (CERN) in Geneva, currently subject to British Government review.

He said a signal to withdraw would be a signal that Britain did not take European cooperation seriously.

To govern Britain these days requires a combination of sympathy, imagination and firmness. Not everybody would agree that we have currently got the balance right. What is definitely missing is flair - that special instinct that some politicians can bring to matters over and above straight intellectual analysis of policy options.

Harold Macmillan exhibited flair. It was what the Supremacy Image was all about. And it was still there in the House of Lords three weeks ago. Such flair is badly missing in the Government. Over the last few weeks they have managed to offend much of its middle-class electorate, with the least benefit and the maximum aggro. Mounting backbench irritation has turned into a tidal wave of annoyance and concern at the unexpected and dramatic changes in the parental means test for student grants.

There is of course a strictly intellectual case for what Sir Keith has done. He has made the means test much more progressive, easing it for those with residual incomes below £12,000 and tightening it severely for the more prosperous families, removing altogether the minimum grant that even the wealthiest in the land were entitled to claim. On paper it looks a sensible reform, which will free money for increasing the budget of the re-

PARTY LINE

Lacking in the vital ingredient

search councils. It may all be very sensible, but it flies in the face of political reality.

The central problem with rational policies is that people are not very rational. Sir Keith's proposals offend MPs with middle-class constituencies where parents have high expectations and want their children to enter higher education. They feel that their children should have the same advantages as they had. And many of them fall into the income bracket hit hardest by the new proposals.

Opportunities to get on in life should lie at the heart of Tory philosophy. That is the "wet" view. The radical right are equally upset that state subsidies are being maintained when they want to reshape the whole of student support and introduce some kind of loan scheme. The Commons motion which has attracted an incredible and immediate response from so many Tory MPs was drafted to catch all of these various disgruntled elements.

Apart from attacking the severity

of the changes, which will make it difficult if not impossible for many families to pay the full contribution, it calls for a fundamental review of the entire student grant and fee systems, based on a more cohesive strategy. When trouble lurks, we all call for a new strategy. Not that it is an automatic answer. The very thinking about it might be quite useful and throw up a few good ideas, but of course the odds are high that nothing much will change. That brings us back to loans. Perhaps the time has come now to change our ways.

By promising such a review, Sir Keith could head off much of his back-bench troubles. The bulk of those signing the motion certainly would like to see the loans issue re-examined. There are, of course, other groups within the total that he could do something to appease by reshaping his package. And he has plenty of time before he needs a vote since the order does not have to be laid until June.

There are those who are most offended by the re-establishment of

tuition fees which have to be paid, others whose primary concern is the abolition of the minimum award. Sir Keith could adjust the package in other ways.

He might consider the abolition of fees for students living at home - certainly for the public sector where families are paying rates as well as taxes for the upkeep of local institutions. The qualifying age for "independent" student status could be reduced from 25 to say 23 or 21. This would postpone the entry of many students and produce longer-term savings which should appeal to the Treasury.

No government in the last 20 years has had a coherent strategy on the use of either grants or fees. Take for example the minimum grant. This was always an odd concept. Whereas the rest of the grant scale was related to ability to pay, the justification for a minimum grant was seemingly that it was a "prize" for gaining the A levels necessary for university entry. For a decade it stayed at £50. Then in September 1977 it was

raised to £80. A meaningless increase, one might argue, bearing no relationship to anything, let alone inflation. The next year it was raised to £200.

Then in September 1981 the new Conservative Government raised the minimum grant to £410; two years later in September 1983 it was announced that it was to be halved to £205. Now we have abolished it altogether.

Or take fees. In 1976, fees were £375. Then from 1977 British students' fees were raised to the purely notional sum of £650, but anybody on a mandatory award was no longer required to pay them. This again had a distorting effect. Wealthier families if they bothered to apply for a grant would receive the minimum of £200 as well as the payment of £650 fees. Now fees have been reduced to £520 and will be payable by families on a net income as low as £15,000.

I was once not an enthusiast for student loans, but one advantage of moving to a system of grants from the poorest and loans for the rest is that at last we could abolish the wretched system of parental contributions.

Keith Hampson

The author is Conservative MP for Leeds North-West.

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WHEN IT COMES TO EDUCATION, APPLE MEANS BUSINESS.



'Quality cannot be bought'

by Ngaio Crequer

Quality could not be bought above a certain funding level, Mr Peter Brooke, under-secretary for education, said last week.

Mr Brooke was making the introductory address at the ninth Royal Festival Hall conference on "the challenge of retrenchment".

He warned against assuming any simple relationship between resources and standards but said: "It is essential to hold on to the best - in terms of institutions and individuals - when rationalizing on the grounds of efficiency. I mean by 'best' in this sense those institutions best fitted for the variety of purposes we expect our higher education system to fulfil."

Retrenchment offered the opportunity to prune selectively. The

National Advisory Body had reaffirmed its desire to use quality as the central criterion in rationalizing but more work had to be done on how quality judgments were made and their weight given regional and other considerations, he said.

He said the NAB had developed a "commendably open" system of formula funding showing clearly what assumptions had been made about student numbers and institutions' financial circumstances. The University Grants Committee system was made and he welcomed the view that more openness was desirable.

In both cases he suggested there should be more emphasis on measuring of performance which could be published and discussed.

Less attention was given to the management of people in higher education than other resources, even though they cost the most money, Mr Roy Butler, management consultant at Hay MSL Ltd, told the conference.

"We do not give enough time, effort or thought to how to train, develop, recruit, monitor and reward the performance of people in higher education."

The maintenance of buildings and equipment and the purchase of supplies was, as one would expect, done by experts under rigorous procedures. "Yet it is significant that the Jarratt committee (on efficiency) is concentrating on the peripheral areas of the university and not looking at the core activities or the largest single item of expenditure, investment in human resources," he said.

"Too many of the people in top jobs in higher education should not be there and if they had known what the job was like before they got it, they would not have wanted to be there," he added.

"There are too many vice chancellors with distinguished research but no people skills, in jobs where the main requirement is leadership and social graces. Too many polytechnic directors come from jobs where they have been excellent departmental heads, in positions where the requirement is to keep the local authority at bay by duplicity and guerrilla warfare."

He said higher education was woefully behind most progressive companies in devising management techniques to get the right people for the right job at the right time.

Not for the squeamish... said one could not talk about standards without taking account of the student grant. The DES could easily reach its lower projections on student demand by its latest policies, he said.

There was evidence in students' work that worries about present or future financial position was having its effect. Students would also be more highly motivated and this might mean they would look for value for money. "That could raise interesting questions about whether teaching was effective, or what subjects the student or parent wished them to study," Professor Reynolds said.

Not for the squeamish...

The first thing a vice chancellor had to decide when faced with rapid retrenchment was whether or not to resign, according to Professor Frederick Crawford, vice chancellor of Aston University.

"There are contemptible, vile and vicious things said during a period of retrenchment. It is not for the squeamish or cowardly," he told the conference. But one should never resign mid-course. Retrenchment was also an opportunity to improve standards.

Professor Philip Reynolds, vice chancellor of Lancaster University,

Storm forecast over Leith decision

A stormy meeting over the future of Leith Nautical College is likely today at the education committee of the Convention of Scottish Local Authorities.

A joint review on nautical education by COSLA and the Scottish Education Department recommended concentrating nautical studies in Glasgow and axing more than half of Leith's courses. But in October, the education committee unexpectedly told the working party to reconsider its report, following complaints from Leith that its case had not been adequately considered.

However, the working party will report today that it sees no reason to change its original recommendation, which will now go to the Secretary of State for Scotland for his final decision.

The education committee has already accepted that declining demand for nautical education means there should be only one centre in Scotland. But there will be a battle over whether that should be Glasgow College of Nautical Studies or Leith in Edinburgh.

The situation is further complicated by the Government still having to decide whether Leith should be transferred from central government control to Lothian Regional Council.

Lothian will make no official comment, but councillors have privately made clear they do not favour the transfer. And if Leith was Scotland's main nautical centre, there would be more pressure on the government to retain it.

But the working party has stated that Glasgow stands clearly as the principal centre for mainstream nautical education. It maintains that it finds no justification for Leith's complaints that projections for future student demands were unreliable, that Leith was better placed as the sole centre since the Forth was a more important port than the Clyde, and that its inability to attract cadets in recent years was due to the threat of closure.

Natthe surprise

Two surprise candidates have been nominated for treasurer of the National Association of Teachers in Further and Higher Education. They are Dr Alan Vetta, from Oxford Polytechnic, and Mr Alan Watkins of Luton College of Higher Education, who join past presidents Mr Chris Minto and Mr Cecil Robinson in elections in the new year. Nominations for vice president are Mr Brian Joffe and Mr Ken Childerhouse.

NERC head pledged to cuts and closures

by Jon Turney

Science Correspondent

The new chairman of the Natural Environment Research Council, Mr Hugh Fish, plans to press ahead with restructuring council expenditure by cutting jobs and closing institutes over the next two or three years.

Mr Fish, former chief executive of the Thames Water Authority, is formally chairman of the NERC for one year, but may stay on to carry through a switch to new research priorities and a shift in spending from council institutes to university grants.

Introducing the council's new annual report last week, he said the council needed to be flexible and selective, and must be prepared to abandon some areas of existing research to concentrate on new strategic science.

The new corporate plan, expected to be released in January, was discussed at a council meeting the day before publication of the annual report, but is still confidential. However, the likely effects of the restructuring are already clear.

The council's future priorities for research will include deep geology, the marine sciences, remote sensing - where there will be closer cooperation with the Science and Engineering Research Council, and atmospheric sciences. This is likely to mean less cash for more general conservation research, freshwater biology and inland ecology.

At the same time, the council is under pressure from the Advisory Board for the Research Councils to cut the number of laboratories maintained by its own institutes, to free resources for university research. The NERC

currently spends £47m from its £60m share of the science budget in-house. But direct support for universities, now running at £11m a year should increase by half over the next five years.

Sir Hermann Bondi, the outgoing chairman of the council writes in the annual report that the only way to achieve redeployment of money on this scale is by rapid staff reductions, and Mr Fish said the numbers lost would have to rise considerably above the 100 posts a year now shed through natural wastage. NERC officials still hope the job cuts can be achieved without compulsory redundancy.

Sir Hermann also made clear to institute directors earlier this year that there was no point in losing jobs without closing laboratories. He wrote then: "Our desired aim of a smaller but scientifically and cost-effective NERC cannot be attained without concentrating on a smaller number of sites." The council has already decided to close portions of the Institute of Geological Sciences and the Institute of Oceanographic Sciences.

Further site closures, including component laboratories of the Freshwater Biological Association and the Institute of Terrestrial Ecology were fore-shadowed in a council memorandum to a parliamentary select committee earlier this summer.

The ITE looks vulnerable as it is the largest institute remaining untouched and a relatively small proportion of its total income £700,000 out of a budget approaching £6m a year - comes from research commissioned by outside agencies.

All the council's institutes are being encouraged to commercialize more of their research.

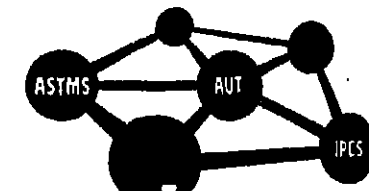
Cuts undermine research says unions' science alliance

A 15 per cent fall in numbers of home postgraduate students over the past 10 years will undermine Britain's long term research effort when competitor nations are expanding their activity, Ms Diana Warwick, general secretary of the Association of University Teachers warned this week.

She blamed the reduction on constraints in spending on the universities, the principal provider of high-level research workers for Government, private and public sector laboratories. "It is now clear that Government cuts in university spending have fallen on research," she said as three trade unions launched the Alliance for Science in a bid to increase public awareness of the need for increased support for research and development.

The alliance grew out of a TUC resolution from 1983 when the AUT, the Association of Scientific, Technical and Managerial Staffs, and the Institution of Public and Civil Servants, all expressed criticisms of Government attitudes to research.

While the AUT and the ASTMS pressed for a massive transfer from military to civil research spending, the IPCS, many of whose members work



in Government research establishments, argued that the solution was not that simple.

The three have now forged the basis for an alliance without reopening differences on this issue, calling for measures to improve civil spin-off from defence research.

The unions say that while the universities have suffered a loss of £460m between 1980/81 and 1984/85, real resources going to the research councils have also fallen, with a further cut of 25 per cent estimated over the coming 10 years. Government research establishments have also been hit.

The alliance also calls on ministers to produce an agreed national science strategy coordinating Government departments, advisory bodies and private investment strategies.



English as she is spoke: Ray Underwood (left) controller of English language and literature at the British Council and Barbara Goldsmid, head of BBC English by Radio and Television, sign a £250,000 publishing contract for *Television English*, overlooked by Sue Lawley, the BBC newsreader who stars in the new video series aimed at English language teachers overseas after trials at more than 50 language film libraries was developed in response to demand from English language teachers overseas after trials at more than 50 language schools in Britain and overseas. The six-volume series and supporting materials are being developed by the British Council in London and Singapore and the first volume will be available next May.

Sir Roger's Oxford connexion runs a speedy full circle

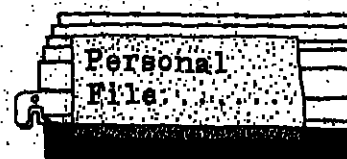
by Paul Flather

Sir Roger Bannister has come full circle in his relationship with Oxford University with the announcement last week that he is to become the new master of Pembroke College, succeeding Sir Geoffrey Arthur, the diplomat who died in May.

Sir Roger, aged 55, a noted authority on nervous diseases, studied at Exeter and Merton colleges, and is now an honorary fellow of the former. He continued his relationship with Oxford because his three children also studied there, two at Exeter and one at the Ruskin School of Fine Art, where his wife, Moyra, was also a student.

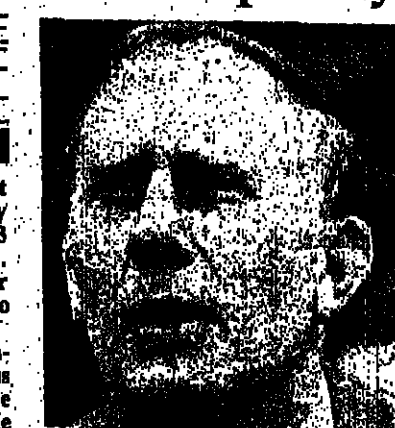
There are other connexions, for example his Radcliffe travelling scholarship to Harvard to continue his research. But his most famous link remains athletic. He won the Oxford and Cambridge mile four times, the British mile championship three times and was an Olympic finalist in 1952.

And it was on May 6, 1954 before



an excited and expectant crowd at Oxford's Iffley stadium that history was made when Bannister clocked 3 minutes 59.4 seconds for the mile. Sadly a car accident, left Sir Roger with a fractured ankle and he no longer runs.

His links with sport have continued, however, culminating in his appointment as chairman of the Sports Council from 1971 to 1974. He instigated a national programme to build recreational sports centres, currently totalling 800 and he is still president of the International Council for Sport, Sport Science and Education. He has also been heavily involved in opposing the use of steroids in athletics and has sat on a Government committee on drug dependence.



Sir Roger, new college master.

After leaving Oxford Sir Roger took up a consultant's post at St Mary's Hospital, London, later moving to the National Hospital for Nervous Diseases. His field has been the autonomic nervous system and he investigates it by studying what goes wrong during illness. Last year, his

book, *Autonomic Failure*, was published by Oxford University Press, no less. He has also redrafted the standard textbook, *Brain's Clinical Neurology*.

He will be the second medic in recent years to head Pembroke after Sir George Pickering, who was Sir Roger's senior professor when he worked in London.

For Sir Roger, Oxford was a chance to strive for intellectual achievement in the midst of a talented generation, and to change direction if need be. He hopes to continue his philosophy, stressing the need to advance "the whole person".

He will arrive next October at a good time for Pembroke. It currently sits snugly at the top end of the Northington table of exam results and has just completed a successful 21st appeal to build new undergraduate rooms. As for sport, Sir Roger still cycles "enough to make me breathe quite quickly", but it will have to take a back seat in his next phase of Oxford life.

Non-tritionals 'best final performers'

by Karen Gold

Non-tritionals students definitely perform better in their final degrees than students who enter higher education after A levels, new research by the Council for National Academic Awards has found.

The research, part of a long-term study of a sample of CNAA graduates, was outlined by CNAA assistant registrar Dr John Brennan at a conference on providing for the learning needs of non-tritionals students in higher education, held at the Polytechnic of North London and sponsored by The THES.

Ten per cent of the sample of 3,000 1982 graduates had non-A level and non-standard qualifications, he said. Provisional results, still to be checked, showed the non-standard students per-

forming significantly better than traditional ones.

Of non-tritionals students 42.5 per cent gained upper second or better degrees; 31.9 of standard students gained upper seconds or above. Nor was the myth about non-standard entry students being very bad or very good true, he said: 38.2 per cent of non-standard entry students got lower second degrees, compared with 41.8 per cent of standard entry students. 17.2 per cent of non-standard students got third class or unclassified degrees; 14.4 per cent of standard entry students got thirds or below.

"The figures say nothing about comparative wastage rates," said Dr Brennan. "But they give support to the contention that capacity to benefit extends considerably beyond those with conventional A levels." ("Capac-

ity to benefit" is the new Robbins principle proposed by the University Grants Committee and National Advisory Body for qualification for entry into higher education, to replace the current two A levels.)

The CNAA had maintained for a long time that anyone should be given the opportunity of reaching the highest academic award of which they were capable, he said. That position had never been repudiated by government, though representations about academic standards had been couched in ways suggesting considerable doubts and misgivings.

Admissions procedures raised political questions, he said: "How do you really compare the student with three grade Cs at A level from two years study in the sixth form, with the student who has a D and an E from one

year of evening classes while working during the day?"

If higher education was genuinely concerned to open up access to more non-tritionals students, then it would have to assess many of its present admissions and teaching conventions, he said. In particular it should look at patterns of student learning and assessment.

"I am sure we can continue to fit non-tritionals students successfully into courses, but shouldn't we be doing more to meet their needs and make it more attractive to them?" he asked.

"Why not keep out the 18-year-olds from some courses and follow the model of the German *Fachhochschule* and require three years work experience, and rethink curriculum and pedagogy accordingly?"

Leader, back page

Student services 'are vital'

by Olga Wojtas

Scottish Correspondent

The National Union of Students (Scotland) has emphasized that student services are a vital part of higher education and that any review must recognize the need to maintain them.

In its response to the Scottish Tertiary Education Advisory Council, which is reviewing Scottish higher education, the NUS says that in recent years libraries, health and welfare services, nurseries, residences, refectories and student unions have been seen as "soft options" when cuts have been made, or have not been sufficiently upgraded as some colleges expand.

The NUS argues that they are all vital: libraries are essential to the quality of study; nurseries help widen access to students with domestic commitments; health and welfare ensures that community care is not overwhelmed by large student populations.

The union disputes projections on student demand from the Scottish Education Department and the Department of Education and Science, and says the key issue is access. The present system is dominated by a full-time course studied over a number of years.

The NUS proposed a new system of part-time and distant learning courses which could be taken by people who could not enter full-time education.

The union adds that all tertiary education, including the universities, should be brought under a single advisory body, and that all institutions should be run by the local authorities.

This view is echoed by the Convention of Scottish Local Authorities, although it notes that the Government is unlikely to accept this, given that it is poised to take over control of two local authority colleges.

A submission from the Committee of Vice Chancellors and Principals, however, firmly opposes any devolution of the Scottish universities. The broad strategy and funding of the universities should be decided on a UK basis, it says, and it believes the University Grants Committee is the most appropriate and efficient planning body for this.

But Stirling University, the worst hit of Scotland's eight universities, is urging a stronger role for the Scottish Office. Stirling approves the current dual funding system for research through the UGC and the research councils, and suggests that dual funding from the UGC and Scottish Office could be introduced for subjects of particular relevance to Scotland.

It adds that if a "seed-corn fund" is to be set up in Scotland to encourage links between industry and the universities, finance should come through the Scottish Office.

Professor Whelan

The funeral of the late Emeritus Professor Robert Whelan, vice chancellor of the University of Liverpool has taken place. At the request of the family the service was conducted privately with only family flowers. Donations may be sent to The Alder Hey Children's Scanner Appeal, Alder Hey Children's Hospital, Eaton Road, Liverpool.

A memorial service will be held early in the new year.



When Michael Pritchard, a geography student at Hull University, bought an old camera for 10 pence in a jumble sale, it marked the beginning of an interest in the history of photography which culminated in Michael, 20, being awarded the associateship of the Royal Photographic Society. His collection of old books and about 200 cameras dates back to 1890 and at 20, he is one of the youngest members of the society to be honoured in this way. Last month, he published a pamphlet *Victorian and Edwardian Photographers in Kingston upon Hull and Beverley*, one of a series published under the auspices of the society.

FCS asks Heath to resign

Leaders of the Federation of Conservative Students have called on their life patron, former Prime Minister Mr Edward Heath, to resign the post because of his criticisms of monetarism.

Their increasing hostility to his critical approach to Government policies culminated in a letter reminding him that FCS's half-yearly council had already voted 112 to 19 for the post to be abolished and that the annual conference next April is expected to confirm the decision.

Chairman Mr Mary Glendenning however, suggested Mr Heath should resign earlier to "avoid any further embarrassment".

In his letter, he wrote: "It is a matter of empirical observation that the reactionary policies associated with the

New research database to be launched

by Jon Turney

Science Correspondent

A new national database listing research in British universities and polytechnics will be launched next year as a commercial venture.

The database is the result of discussions by the University Directors of Industrial Liaison, which has approached the Department of Trade and Industry to help with launch costs. A steering committee bringing together higher education, the department, the Science and Engineering Research Council and the British Technology Group agreed to pass the project to Cartermill Publishing Ltd in Scotland, which will receive extra money from the Longman Group and the Scottish Development Agency.

Universities and polytechnics will be able to enter details of their research and facilities or free and industrial subscribers will pay for taking information out.

The new venture was welcomed last week by Lord Flowers, chairman of the Committee of Vice Chancellors and Principals, speaking at a Confederation of British Industry conference in London on university-industry liaison. He said he hoped the database would increase appreciation in industry and commerce of the contribution academic research could make to innovation.

Lord Flowers cautioned against too large a move toward applied research in higher education. "Many of us worry that financial pressures are being used to drive us too far towards meeting industry's short-term needs," he said. In this he took a different view from Sir Keith Joseph, Secretary of State for Education and Science, who told the conference the most important thing the Government had done to promote closer academic links with industry was to put the squeeze on higher education institutions.

Lord Flowers also called on the Government to act on the recommendations of the Muir-Wood report on academic industry links. The report, approved 18 months ago by the Advisory Council on Applied Research and Development, called for a seedcorn fund to reward institutions which won industrial contracts. Sir Keith said he hoped the Government would reply to the report before next Easter.

Sir Terence Beckett, director general of the CBI, also welcomed the plans for a new database, but he told the conference it would need to be augmented by a national network of innovation or technology brokers, to help bridge the divide between industrialists and academics.

Inspectors find a professional shortage

Bretton Hall College of Higher Education's secondary BEd course is criticised for not providing adequate professional training by Her Majesty's Inspectorate in a report this week.

The inspectorate says that in the BEd courses for intending teachers of music and fashion textiles, the subject-related professional work is not strong enough and the links between the elements of the course are tenuous.

However, the report praises Bretton Hall's considerable strength in the expressive arts and training for the secondary phase.

It is part of a national survey of teacher training in universities and the public sector which is being used by both the Council for the Accreditation of Teacher Education and the National Advisory Body's teacher education group in their separate inquiries on the system.

The HMI says that the college has accepted the challenge of increasing the numbers of its primary students by 1985/86 330 out of the 750 full-time students will be trainee teachers and has appointed staff with recent primary experience.



Plenty of shadow, no substance

The pervasive influence of British universities over the rest of the education system is well documented, so perhaps the latest solution to the problems of public sector higher education, for polytechnics (all - or only some?) and some colleges to be redesignated universities, should not take us by surprise.

It is not entirely clear which problems this is designed to solve. It is suggested that polytechnics have a crisis of identity since a recent MORI poll reported widespread public ignorance about them and their role. Certainly such ignorance among MPs and industrialists is dispiriting but thousands of young people are still applying to study in public sector institutions and they and their parents seem to find little difficulty in identifying the courses polytechnics offer.

Moreover some of the reported perceptions are quite accurate. Over half of all MPs thought polytechnic facilities were not as good as those in universities; in broad measure they are right and that view would be supported by all who know the chronic history of underresourcing in the polytechnics. What is heartening is that very few thought polytechnics provided a worse education.

Some polytechnic directors are more open about their aims. For them this is a new variant of their campaign to take the polytechnics out of the local authority sector.

Until recently they have focused their ambitions on achieving chartered status or some similar model of polytechnic government which would help them to achieve autonomy. One suspects they really do not care whether the institution is called a university, a polytechnic or a college of higher education, just as long as it is self-governing and they are in the driving seat.

Whatever the existing problems for public sector institutions the National Association of Teachers in Further and Higher Education is convinced that turning polytechnics into independent bodies provides no answer to the real problems which beset them. Moreover our members, already suffering worsening employment and career prospects, would be rightly sceptical at the idea that removal of local authority control would increase the chances of their professional aspirations being met.

There are those attracted to the idea for radical reasons. Broadening the concept of what constitutes a university will, it is suggested, dent the elitism of the British education scene. Hence the attraction of local authority universities. But this would open up the real debate about the binary line and whether it is still of relevance.

The only really sound argument for campaigning for university status is if such a designation will entitle institutions to receive the same level of resourcing as other universities in the United Kingdom. For a financially beleaguered public sector that would be a prize worth having and Naffis has been demanding parity of funding with the university sector for some time.

Parity of esteem and status is all very well but parity of funding is the real key to the disadvantage presently suffered by the public sector. That's why, at present, we are of the view that this campaign is all about the shadow and not the substance - for after all, what's in a name?

Jean Bocock

The author is assistant secretary (higher education) at the National Association of Teachers in Further and Higher Education.

overseas news

Irish report claims sex discrimination

from John Walsh

DUBLIN

Only one in every 74 professors in Ireland's universities is a woman, says a report which claims that there is discrimination against women in higher education in Ireland.

It says that women are confined to small and powerless positions within the academic profession. Unless positive steps are taken to enable them to break out of that constricting circle their future prospects will be bleak.

If action is not taken as a matter of urgency, policy and curricula will continue to be formulated and controlled by men, says the report prepared by Ms Ailbhe Smith of University College, Dublin. The study was commissioned at the request of the Irish National Advisory Group for the EEC action programme on the promotion of equal opportunities for women.

The report presented to Irish education minister Mrs Gemma Hussey says that women comprise just under 19 per cent of academic staff in third level institutions. This drops to 12 per cent for technical colleges and descends to an "abysmal 10 per cent" for the recently established and expanding National Institutes for Higher Education in Dublin and Limerick.

Significantly, the proportion of women academic staff rises to 38 per cent for colleges of education, where women students are in a large majority, and house around 16 per cent of full-time appointments in the university sector.

Women academics are trusted in a limited range of subject areas, mainly arts, education, social science and are almost invisible in traditionally male and professional scientific and technological subjects.

The report points out that the scarcity and low status of women academics is not peculiar to Ireland. Studies carried out elsewhere in Europe, in Australia and in America show that the proportion of women teachers and researchers in third level rarely exceed 20 per cent.

Turning to the governing bodies of Irish universities, the report says women's role in that area is especially depressing. College governing bodies are either exclusively male or contain very small numbers of women.

The statutory officers in four universities are all male. Of the eight university and college officers in Trinity College, Dublin only one is a woman. "It is impossible to avoid the conclusion that women are very seriously discriminated against in decision making bodies in the university sector," says the report.

An examination of the secretariat of the three third level administrative degree awarding bodies revealed a familiar structure: of the 15 officers only two are women.

Accepting the report Mrs Hussey urged third level colleges to make a positive response. The setting up of a working party to examine its recommendations would be a welcome initiative and one that could be undertaken by the Higher Education Authority, she added.

Mexico sets up guidance system

from Emil Zubryn

CUERNAVACA

Alarmed by the growing ranks of Mexican unemployed university graduates, President Miguel de la Madrid Hurtado has established the National Educational Orientation System. Its main purpose will be to inform students about options they have in studying for professional careers and it is hoped this will relieve the saturation levels in certain careers.

Before the presidential decree, Octavio Rivero Serrano, dean of the National University of Mexico (UNAM) admitted that the country's educational system had failed to direct students in selection of studies.

In the past the system "failed" students and universities turning out graduates were classified on more than one occasion by concerned educators, as "factories of the unemployed".

Dean Rivero Serrano acknowledged that there had been a sheer waste of time and money in educating graduates who ended up in the ranks of unemployed because there was no room for them in professions they chose.

Now, with the government, the UNAM and other Mexican universities, the hope is that a full-scale orientation programme will provide information and forecasts on what the job market will be like after students spend six years in school.

The medical sector is one glaring example, Rivero Serrano said. Medical schools throughout the republic were congested with students, far more than private practice and the government health system could absorb.

On the other hand, areas in medicine employing X-ray technicians, biologists, nurses and other middle professions were in desperate need of personnel. There were also far too many lawyers, architects and journalists, and too few engineers and other people in key vocations required for national economic development.

US right-wingers call for student aid changes

from Deborah Kasouf

WASHINGTON

The Heritage Foundation, an influential, conservative think-tank, has recommended that the Reagan administration drastically reduce the functions of the department of education, and distribute federal student aid to institutions instead of to students.

The recommendations are just two of some 1,300 proposals contained in the foundations report, *Mandate for Leadership II: Continuing the Conservative Revolution*, which was recently distributed at a White House cabinet meeting.

Calling the creation of the education department a historic blunder, the report suggests it be turned into "an agency of minimum nuisance, modest scope, and yet positive moral influence of the nature and quality of American education".

The report recommends that federal student aid funds be distributed directly to colleges and universities, which would in turn distribute them to needy students.

Pell Grants, the major federal grant programme, are distributed directly to qualified recipients, a method of fund distribution which reserves a student's freedom in choosing which institution to attend, according to the programme's supporters.

Federal subsidies for college students should be concentrated on qualified, needy students, according to the report, which proposes significant changes to prevent middle and upper-income students from receiving college grants.

"Subsidies should no longer be available to students who can, perhaps with the help of their families, pay for their own education, or to students who are not interested in attending college but are wooed by student-hungry institutions holding out the lure of federal assistance," the report said.

The purpose of the funds, it adds, is not to increase the fiscal comfort level of the upper middle class, to relieve parents of their responsibility to educate offspring, or to assist otherwise noncompetitive colleges to keep their classrooms full of otherwise uninterested students.

The report also suggests the Reagan administration support legislation that would require students receiving financial aid to meet minimum academic standards.

In a recent *Washington Post* interview, Eileen Gardner, author of the report's chapter on the education department, defined a qualified aid recipient as someone with demonstrated academic ability on solid, substantive, high-level tests, such as the Scholastic Aptitude Test, the most widely administered pre-college examination.

Critics of such standardized tests have charged that the tests are often unfair to socially disadvantaged minorities, and Ms Gardner said she recognized that using test scores as the single measure of ability might have a negative impact on minorities.

"Absolutely the opportunity ought to be there for everyone and anyone who can demonstrate academic ability to have the opportunity to go on to higher education. And if there are imbalances as a result of that, it's quite all right," she said.

"One of the things (in our society) is that we have confused an individual's worth with an individual's academic ability, and we need to decouple those two concepts," she said.

Other recommendations for education included in the Heritage Foundation report are a phase-out of federal interest subsidies on Guaranteed Student Loans, and a requirement that middle- and high-income students pay interest on their GSE loans immediately upon graduation.

Riots over drink curbs

American students protesting against the raising of the legal age for drinking intoxicants to 21 have rioted on campus and have taken to the streets, often in drunken disorder and frequently violent causing damage to college property and injuries to the police, citizens and themselves.

This is a curious spin-off of some political opportunism of President Reagan, who, when he realized that there was rising public concern over drunken driving and resulting road deaths, took steps to force the individual states to curb drinking by young people.

Despite his much heralded campaign programme "to take the government off the backs of the people", Reagan threatened to deprive individual states of federal highway building and repair funds unless the states raise the legal drinking age to 21.

Realizing on which side their roads were surfed, 29 states are enacting legislation to raise the legal drinking age to 21.

Universities and colleges have backed up their legislators by crackdowns on student drinking. The strictest has been total prohibition by the University of Maryland. Most universities now insist that organized parties be cleared with the administration and that the age and identity of visiting guests be checked at the door.

"To take away the right to drink (intoxicants) is something that calls for some type of unrest," said Mr Gregory Moore, head of the US Student Association, the largest Washington lobby representing college students. "I am surprised that it took this long for students to react. I think that we are only seeing the beginning of these uprisings."

Communist Party for the defeat of the partisan movement of 1941 and accusing Tito and the party of trailing in the wake of the "spontaneous uprising", allegations hitting at the very legitimacy of Communist rule in the country.

A number of other factors also help to explain the authorities' concern: headline party leaderships in Croatia and Bosnia-Herzegovina were also pressing Serbia to take a much tougher attitude on its dissident movement, and there were fears that Dijas might become a focus for groups restless at the failure of the authorities to fill the political vacuum left by Tito's death in 1980.

The Croatian authorities even went so far as to issue a document, dubbed the White Book, criticizing some 200 Yugoslav writers, scientists, artists and public figures, for anti-socialist work undermining the "basic socialist achievements and 'Stalinist past' of the country."

The sharp fall in living standards plus a high rate of unemployment, particularly among university graduates, have added to the problems perceived by the authorities.

Cuba sends students to USSR

from Patricia Smith

HAVANA

More than 10,000 young Cubans are studying in the Soviet Union and a similar number have already graduated, it has been revealed.

Soviet higher education ministry representative Villy Triakov, speaking in Holguin recently, said that the Cubans, mostly science and technology students, were attending some 250 further and higher education institutes in 60 towns in the USSR.

In addition, between 250 and 300 top-level Soviet experts were working in Cuba as advisers, he said.

This huge overseas exchange is just one aspect of the cooperation package deals under Comcon which in 1971 agreed in principle to give preferential treatment to underdeveloped member states to level up their economies.

Cuba, which joined Comcon in 1972, was the first Latin American country to wipe out illiteracy and introduce obligatory education, but its rapid annual growth rate, which in October stood at 9.2 per cent, has left glaring gaps in its ability to provide specialized personnel.

The Comcon plan put special emphasis on science and technology so that the underdeveloped states - Cuba, Mongolia and Vietnam - would acquire this skilled labour force.

Part of this aid includes the training of young high-fliers on courses up to five years long in the more industrially advanced socialist countries, principally the Soviet Union.

A cooperation agreement between Cuba and the Soviet Union up to the year 2000 made public on November 15 foresees Cubans training in specialized middle and higher level institutions and leading personnel, specialists and workers in USSR companies and organizations.

It also includes the development of scientific research with a transfer of documentation from the Soviet Union, joint research projects and in general the raising of the qualifications.

Soviet and Comcon aid extends to large sectors of the economy including agriculture, energy and nuclear power, metallurgy, electronics, fishing, geology and machinery production.

Scholars to get 10% bonus

Scholars working for the Polish Academy of Sciences have been promised a pay rise that will put their average wage some 10 per cent above the national average, rising to 30 per cent above national average in the next three years, Dr Zdzislaw Kuczmarski, the scientific secretary, announced to a meeting of the academy presidents' presidium last week.

At the same time, he said that the academy budget would be "strengthened" by an additional 1,000 million zloty in 1985 from the Central Technical Fund. Investment in research would also improve next year, he said.

In real terms, the announcement is less glowing than it sounds. Poland's only 2.5 per cent of its national income to science, whereas for most developed countries the figure is almost twice as large. Kuczmarski apparently made no mention of any additional allowance for the academy of the vital hard currency, lack of which has not only inhibited the input of vital scientific equipment, but has also meant no subscriptions to foreign journals.

Although foreign colleagues have made a gallant effort to help bridge this information gap by sending off prints, journals, and books to their Polish colleagues, such assistance can be at best only temporary and local.

California top

A new survey listing 100 of the brightest young scientists under 40 in the United States says that California is the country's science capital. California leads the US in industrial research laboratories and in federal spending for research and development.

overseas news

Humanities graduates 'are uncivilized'

from Deborah Kasouf

WASHINGTON

Humanities courses in US colleges and universities have drifted toward "curricular disintegration" and students who lack "even the most rudimentary knowledge about the foundations of their nation and their civilization," are graduating according to Mr William Bennett, chairman of the National Endowment for the Humanities.

"What we have on many of our campuses is an unclaimed legacy, a course of studies in which the humanities have been siphoned off, diluted, or so adulterated that students graduate knowing little of their heritage," Mr Bennett wrote in a 42-page report released last week.

The report, *To Reclaim a Legacy*, is the result of eight months of discussions with a 31-member study group appointed by Mr Bennett to assess the condition of the humanities in higher education.

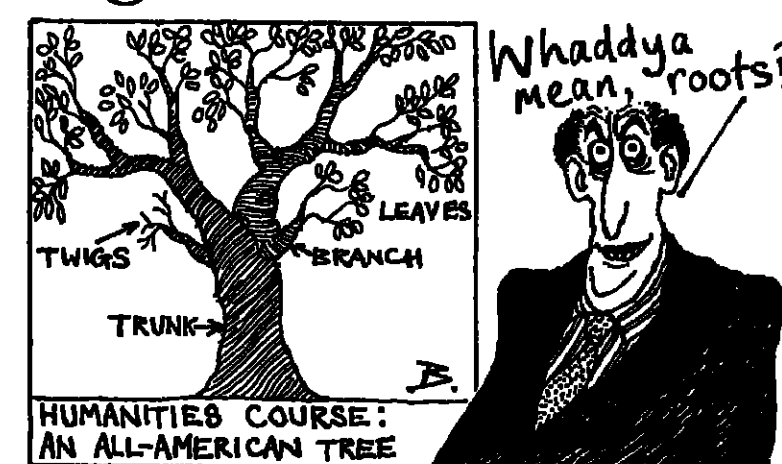
The study group found that:

● A student can earn a bachelor's degree from 72 per cent of all US colleges and universities without having studied American history or literature, from 75 per cent without studying European history, and from 86 per cent without studying classical Greece or Rome;

● While the total number of degrees awarded rose 11 per cent between 1970 and 1982, the number of college students graduating with bachelor's degrees in English dropped by 57 per cent - in philosophy, by 41 per cent, in history, by 62 per cent, and in modern languages, by 50 per cent;

● Fewer than half of all colleges and universities now require foreign language study for a bachelor's degree, down from nearly 90 per cent in 1966.

While acknowledging that the sharp decline in the number of students



majoring in the humanities is partly due to students' concern for finding well-paid jobs after college, the report places equal blame on academic administrators and faculty members.

"The decline in learning in the humanities was caused in part by a failure of nerve and faith on the part of many college faculties and administrators, and persists because of a vacuum in educational leadership."

Mr Bennett wrote: "We have blamed others but the responsibility is ours. Not by our words but by our actions, by our indifference, we have brought about this condition. It is we the educators who too often have given up the great task of transmitting a culture to its rightful heirs."

The report focuses on what it describes as the two basic prerequisites for learning in the humanities - good teaching and good curriculum - and makes recommendations for improvement in both areas.

Of all undergraduate credit hours

taken in the humanities, 87 per cent are taken during freshman and sophomore years, according to the report, with non-humanities majors accounting for the largest part of those credit hours.

The report therefore stresses the primary importance of quality in introductory courses, warning that if students "do not experience the best the humanities have to offer early in their undergraduate careers, they are unlikely to come back for more."

The report questions the common practice of leaving the teaching of introductory humanities courses to graduate assistants or part-time faculty, and blames graduate schools for training "narrow research specialists" who are "poorly equipped" to teach undergraduates.

"Many graduate schools... no longer address adequately the more pressing need of higher education for good teachers, broadly versed in their fields, inspired by the power of their

subjects, and committed to making those subjects speak to the undergraduate," the report said. "Unless our graduate schools reexamine their priorities, much of our teaching will remain mediocre and our students indifferent."

In order to improve humanities curricula, colleges and universities must reshape their undergraduate curricula based on a "clear vision of what constitutes an educated person, regardless of major," and faculty should "put aside narrow departmentalism" and work with administrators to structure a challenging common curriculum with a core of common studies, the report says.

Citing the recent Kerr commission report on presidential leadership, which found that only 2 per cent of the 700 college and university presidents interviewed played a major role in academic affairs, the study group stated that presidents should actively participate in the academic affairs of their institutions.

"College and university presidents must take responsibility for the educational need of all students in their institutions by making plain what the institution stands for and what knowledge it regards as essential to good education," the report said.

The study group agreed that any curriculum adopted should be well-balanced, based on original texts, extended throughout the college career, and reflect areas of faculty strength.

The group concluded that an understanding of the origin and development of western civilization, a careful reading of major works in English, American and European literature, an understanding of major philosophical ideas, and foreign language proficiency, should be essential parts of any humanities study.

Witwatersrand to host foreign policy research

from Carolyn Dempster

JOHANNESBURG

South Africa's foreign policy since the union in 1910, disinvestment, international terrorism and the international dimensions of the trade union movement are likely to be the key areas of focus of a foreign policy research programme currently under consideration.

Proposals for the establishment of the programme have been drawn up by the University of the Witwatersrand's department of international relations, the only university teaching department in international relations in Africa.

Motivation for the establishment of such a programme is that South Africa lacks behind other countries when it comes to the documentation of foreign policy, says Professor Dirk Kunert, head of the department.

He hopes that if the programme is approved by the university administration, and the necessary funding is forthcoming, it will develop into a research institute in time - able to make a crucial contribution to local and international debate on South Africa's position in the world.

If all goes well, the programme should be launched by mid-1985 and Professor Kunert hopes to lure two or three academics from Europe and the United States to undertake the initial

research. The disinvestment, "long overdue" for research, is to be one of the priorities of the programme, as will be publication of a series of volumes on South African foreign policy.

Not only will the programme provide a forum for much-needed research, but it will be complementary to the teaching activities of the department. It will provide the ideal opportunity for Wits to tap the expertise of the foreign academics, and enlarge the syllabus at the same time, says Professor Kunert.

● The long-awaited academic salary increases have been awarded at least three universities, with senior academics receiving increases ranging from 15 to 23 per cent.

For the first time this year, universities were given a lump sum and the autonomy to decide how the increases should be awarded.

A decision of the Committee of University Principals gave universities the independence to allocate the state funds as they wished, as long as the increases corresponded to a key scale determined by the state.

As a result most senior academic staff have received an average 23 per cent rise backdated to October 1.

The cost of implementing the increases has been estimated at R5.7 million.

Colleges ban exam results

from Geoff Maslen

An extraordinary row broke out between Australian academic unions and the Hawke government in the run-up to the federal elections last week.

Academics employed in New South Wales colleges of advanced education refused to lift bans they had imposed on processing students' end-of-year examination results in an effort to force the government, which was subsequently returned, to increase its funding for the colleges.

The bans, affecting more than 30,000 students, were imposed last month and are part of a campaign by the academics' state union to draw attention to the Hawke government's failure to meet its last election pledges.

Over the past three weeks, the academics have continued to mark

examinations and student essays but have refused to pass on the marks or grades to the colleges' administration.

Last week, the colleges took the issue to the state industrial commission. The commission ordered the unions to lift the bans but academics said they would have to meet to discuss the issue. They said if they did lift the bans they would still consider further industrial action.

The academics accused the minister for education, Senator Susan Ryan, of being totally irresponsible and of deliberately prolonging the dispute in an attempt to turn student support away.

Senator Ryan told a Sydney newspaper, however, that there was no chance of additional money being made available to tertiary institutions in 1985.

Teacher training improved as fine is revoked

by Geoffrey Parkins

Following its consideration of proposals put forward by the National Union of the Teaching Profession, the Education Ministry in Kuala Lumpur has revoked its fine of £8,333 and ban on university places for 141 of the teachers who recently resigned from teacher training courses. The ministry has also altered the timing of teacher trainee intake, so that places are offered only after the Central Universities Unit has released the names of successful university applicants.

The new arrangements overcome the problem of students being faced with the dilemma of finding out they have won a university place five months after starting their teacher training courses. Resignations for this reason, averaging 5 per cent of intake, had caused the government much concern at a time when the country

faces a serious shortage of teachers in key subjects.

Under the new arrangements there will be two intakes of trainee teachers each year - one in January and a second in July.

However, the Education Minister Datuk Abdullah Ahmad Badawi emphasized that his revoking of the fine and the university ban was a "special concession" for those who had resigned recently, which "would not be repeated for future trainees who contravened their agreement with the ministry". The teachers to whom the concession was made must return to serve the ministry on completion of their university courses.

What is impressive is the education minister's courage to reverse a decision after listening to the teachers' union recognizing that it had a valid case.

In September The Times Higher Education Supplement

published a 4-page analysis of the joint statement from the University Grants Committee and the National Advisory Body regarding the basis for considering the present and future role of higher education in our society.

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Instant pundits or considered experts? Paul Flather on the role of academics in the NUM dispute

After more than nine months of bitter wrangle the issues in the miners dispute seem as intractable as ever. But as the enormous historical and political importance of the strike is recognized, so more and more academics have been drafted in to clarify and to comment. Even mathematicians staging a conference in Cambridge later this month plan to discuss the dispute with reference to game theory and probability.

Yet for all the professional expertise, primarily from economists and energy specialists, but also from sociologists, industrial relations experts, political scientists, even geologists, "the facts" remain in as great dispute as ever, and the great debate over the definition of an "uneconomic pit" not surprisingly rages on. Mr. McKelvey, the vice-president of the National Union of Mineworkers, is even searching for a one-handed economist, because he is fed up with those who keep saying "on the one hand... but on the other hand". The question then posed is: are the academics in some sense failing the nation by not giving us the facts, say about coal stocks, or energy demand, or energy supplies, or likely job losses from the new mining technology?

One difficulty faced by academics is finding a channel to express their views, and get them noticed. Hardly any academics seem to have intervened in the public debate of their own accord. In almost every case, certainly where serious research has been involved, it has taken a specific invitation from one or other protagonist or say London Weekend Television's authoritative *Weekend World* programme before a specific report has been produced.

In general the media are only too anxious to find space or time for yet another view on the dispute. But it does raise a question about channels. As one professor put it: "We can always write in a learned journal. But then no one would notice."

The academics who have intervened seem to fall into two types: the commentators and the diviners. A typical example of the first type is Professor Ian Fells, professor of energy conservation at Newcastle University, who can hardly remember the number of radio and television interviews he has been on, ranging from a 7 am start to talk on the BBC *Today* programme, to a 11pm studio visit for a BBC *Newsnight* interview.

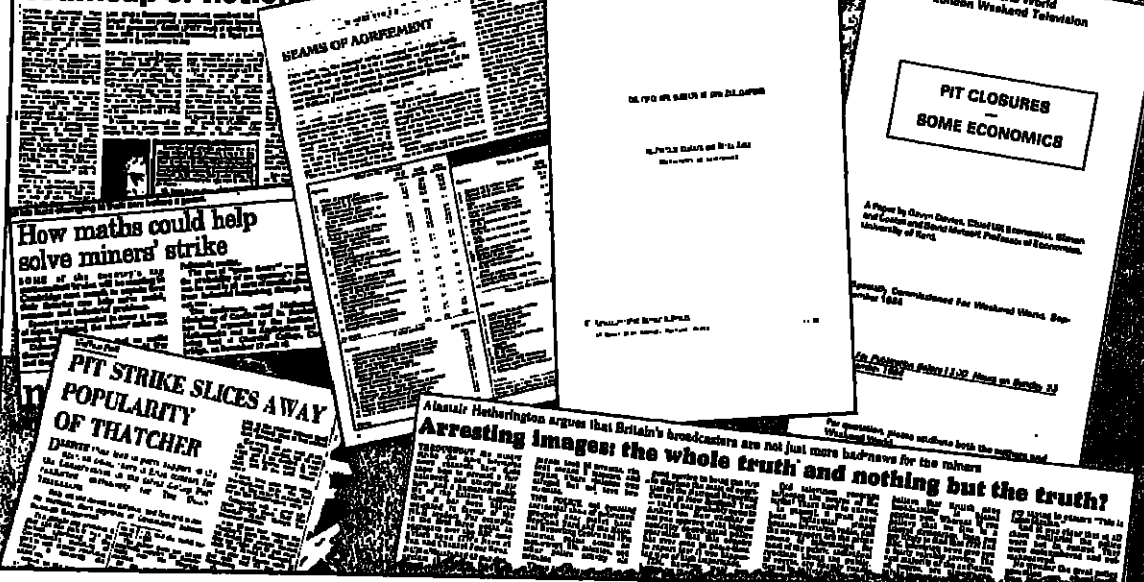
Professor Fells has a record of research in the field, and his research group at Newcastle is in the middle of a three-year study of coal with particular reference to open-cast mining, one of the controversial sides of the dispute. Unfortunately *The Industrial and Economic Future of the UK Coal Industry* will not be complete for some time yet. But he has been commenting. He is an outspoken critic of Arthur Scargill's position. Other reactions include the new band of city analysts such as Paul Nield of Phillips and Drew, the stockbrokers, who are able to supply a quick macro-economic model so loved by the media.

The diviners include Professor David Metcalf, professor of economics at Kent University, who together with Gavin Davies of stockbrokers Simons and Coates, produced a report for *Weekend World* called "Pit Closures, some Economics". They worked out a cost-benefit analysis to the nation of keeping open (or closing down) the coal 12 per cent mines or worst 50 to 60 pits. Working in "a spirit of compromise" the authors concluded that five pits a year should be closed on average.

Professor Colin Robinson, professor of economics at the energy economics centre at Surrey University, has done a lot of broadcasting, written several articles, and has an article on cost-benefit appearing in the January edition of the *Economic Review*. He was drawn into the field when he appeared for Leicestershire County Council in 1978 to 79. Vale of Beavor inquiry. He has been representing the likely demand for coal.

There was bound to be trouble. The chickens are coming home to roost. Over at the Science Policy Research Unit at Sussex University, Sussex, Professor John Surrey heads an energy group which includes Mr. John Cheshire, who has done numerous interviews, and Dr. John Skea and Mr. Steve Thomas who produced a report on coal stocks for *Weekend World*, called "The Miners' Strike and Electricity Supply". The two had a week to do the report which tended to confirm

Digging for truth in a coalheap of fiction



Academics at the coalface

Government statements that coal stocks would last until next March before rationing began.

Mr. Jonathan Winterton, convening a four-member working environment research group at Bradford University, has produced two reports on Minos, the new technology he believes is at the root of the dispute. By raising productivity in certain mines, leading to savings and job losses, Minos in fact suddenly changes the profit-loss definition of other pits which may have been working normally for years.

Mr. Winterton, an industrial relations expert, is also working on a longer study with Ruth Winterton of the Northern College, Barnsley, on the tactics used in the strike. In particular, he believes the NCB has broken new ground by using US style tactics in its active fostering of a back to work movement, giving incentives, providing facilities and support.

A report which caught the headlines was one by Mr. Andrew Glyn, a Marxist economist at Corpus Christi, Oxford, taking into account the longer term costs of unemployment caused by closing down a pit. The report was done for the NUM which had been pointing out the costs since March. But it took interventions from academics before the point really struck home. It is a point picked up by the Anglican bishops, most notably Professor David Jenkins, the Bishop of Durham.

Dr. Huw Benyon, reader in social studies at Durham University, has given several lectures and countless interviews on the dispute. He has given evidence to several inquiries into open-cast mining, saying that weight is given towards deep mining should be maintained. He points out the natural difficulties of a compromise because the strike is about jobs and not wages. As such, he believes the parallels by Tony Benn and Enoch Powell to revolve and rebellion of past centuries are well drawn. He is now editing a book on the dispute, to be published in January by New Left Books with articles from Jonathan Winterton, Mr. Robert Fryer, principal of Northern College, and Mr. Colin Sweet of South Bank Polytechnic, among others.

Mr. Sweet, director of the Centre for Energy Studies, has written on the definition of "uneconomic" pits and Plan for Coal. He believes the Government has been facing two ways on coal mining, wanting to run it down for political reasons, yet conscious of the need for coal to offset any Middle East oil black-mail. The British Geological Survey has entered the fray with Dr. Richard Crockett pointing how the lives of coalfields were being shortened by deliberate concentration on certain seams. Mr. Bill Robinson of the London Business School has shown how jumps in miners' pay had changed the profitability of certain mines.

More recently a team of five accountants under Professor David Cooper, professor of accounting and finance at the University of Manchester Institute of Science and Technology, and Professor Tony Lowe, professor of accountancy and financial management at Sheffield University, argue in an article due to be published in *Accountancy* magazine that NCB accounting procedures, including the famous £23 system, do not form an

adequate basis for informed management decisions. The five are constrained because they have worked with the NCB and could be deemed to have had access to privileged information. But the article at present suppressed is widely seen as a telling indictment of methods so far used by the NCB.

Professor Patrick Minford, professor of economics at Liverpool University, a leading free market theorist, has co-written with Peter Kung a paper on cost-benefit analysis of pit closures, trying to unravel levels of compensation due to the miners. His point, in contrast to say Professor Metcalf's work, would be that given public expenditure limits and a desire to create jobs it can easily be shown that £1 billion spent creating more jobs in industries other than mining. James Algie and William Foster of Brunel University have run through a simulation of the dispute known as a Priority Decision System, certainly a different approach.

Surprisingly little research seems to have been done on the strictly legal and industrial relations aspects of the dispute, though Mrs. Christine Edwards, reader in sociology at North East London Polytechnic has an article on the subject coming out in the March issue of the *British Journal of Industrial Relations*. Dr. John Weddington and Mrs. Patricia Leopold of Reading University are doing a paper on the public order implications of the picket violence for the Institute for the Study of Conflict. The Legal Action Group in London has investigated sentencing policy, and the social security rules and the National Council for Civil Liberties is monitoring police activities. Professor Ben Roberts, professor of industrial relations at the London School of Economics, is actively involved advising ACAS.

Why do they intervene at all in a current debate? It certainly cannot be the money. To wake up early for the *Today* programme will result in £19.65 payment, while a *Weekend World* report would earn £200, though every one is coy about the amounts involved. Many do concede it is a public duty. Professor Metcalf admits feeling a duty. Certainly he would have contributed his thoughts at some point, but the LWT invitation helped to concentrate the issues.

Clearly there is much to be gained by being regarded as an, or even the, expert in a field. As Mr. Thomas of SPRU said: "It's certainly useful to be able to put your name about. This is especially true as SPRU is a designated research centre backed by the Economic and Social Research Council which will be keen to see some applied benefits coming from work in its units. Professor Fells of Newcastle is even more candid: "Yes, I am sure vanity is part of it."

But whatever their sense of duty and their relish for debate, most needed to be goaded to produce a directly relevant piece of work. One professor said: "I'm afraid it takes chaps like you to stir us up." Professor Minford said that academics simply do not find it easy to react to things going on around them which may well and tomorrow. Certainly easy access to a television for publication can make a difference. Mr. Thomas of SPRU made the point

that any intervention in this debate could so easily appear to be politically motivated, leading many academics to be cautious. The SPRU team is continuing to monitor coal stocks, but it is unlikely they would have got so involved without LWT's invitation.

The assumption made for every academic intervening is that they have some relevant professional expertise. Professor Fells made the point strongly that academics should not stray outside their fields of expertise. This would devalue the contribution made by the academic community in general. Professor Robinson was uncertain if expertise had been as well deployed as possible. Mr. Glyn warned of the dangers of pontification.

Dr. Benyon was quite clear that the debate on the important issues had not really taken off. "We are nine months into the dispute and there is still no real clarification of the issues. I do think academics should have been more involved. They should not fall into rhetoric or ideology clearly, but nor should be used by the media or politicians," he said.

There were interesting views about whether the contributions from academics had helped to clarify or cloud the issues. Most were pretty certain the issues had been clarified, though of course academics were expected to disagree among themselves. Many were worried about the lack of a coherent framework in which to place the debate. Thus Professor Robinson felt the media had not helped by concentrating unduly on short term issues such as the coal stocks row or the drift back to work. As Mr. Sweet pointed out, a huge dimension was missing by leaving out future energy demand and supply, electricity, and coal industry. Professor Fells helped Channel 4 produce a series in the summer which included a programme on the energy dimension which appears to have passed largely unnoticed.

The media of course plays the crucial role in helping to clarify debate. Many academics felt programmes like *Weekend World*, *Newsnight* and *Today*, had worked hard "to get it right" but they felt some of the print media had been little short of disgraceful.

Mr. Benyon for example described all the time talking to the media as "pretty much a waste of time". Mr. Winterton said he must have spent hundreds of hours talking to journalists and "the results were negligible, enough to fill a couple of sides of a paper". He said he had put a lot of energy trying to get journalists to see the important restructuring going in the industry but it was not exactly good television, when compared to a police truism. He also spoke of several journalists who had said they could not use his material allegedly because "it was editorial policy to try and get the strike settled, not stir it up".

Yet as Dr. Michael Tracey of the independent Broadcasting Research Unit pointed out the problem lies as much with viewers as the media. Most people just watch the old news programmes or read a newspaper such as the *Daily Mail* or the *Daily Mirror*. Even if they watched the two flagship programmes, the *Nine O'Clock News* and *News At Ten*, they would still have a very distorted view of the picture

of the dispute, mostly of picket versus police violence. "The problem is that people just don't watch *Weekend World*. They don't drink at the same well."

The Edinburgh Television Festival in September brought to the surface bitter feelings about media coverage, with Arthur Scargill accusing the media of gross bias against the NUM, and Professor Alastair Hetherington of Stirling University saying his analysis showed it to be fair. Dr. Tracey is now heading a research project monitoring coverage of the dispute on the two main news programmes.

The group, helped by Dr. Guy Cumberbatch of Aston University, have already uncovered some interesting findings. Scargill totally dominated the early coverage of the strike and the Labour Party issued ten times more statements than the Government. The study is being extended until the end of the dispute, which regrettably means any results cannot be fed into current coverage.

One of the problems, as Professor Peter Matthias, professor of economic history at Oxford University, noted, is to do with the symbolism of the dispute which somehow takes over from detailed, fine, reasoned arguments. Professor Matthias, who is editing a series on mining for the Oxford University Press, said the gap between public rhetoric and private professional argument was greater in this dispute than any other.

It reminded him of some of the great religious disputes of the past in central Europe when thousands would be killed in what appeared to be a dispute about whether the sign of the cross involved two or three fingers, oblivious of the complex theological issues at stake. In the current dispute perhaps the pit community and the exhausted pit have become the two extremes, whatever academics may contribute.

Professor John Eldridge, head of Glasgow University's Media Group, said he had detected real alienation from some academics towards the media. "They feel cheated at the way some statements have been distorted, though of course reporters face great problems. The most common complaint is against 'agenda-setting'. But Professor Metcalf on the other hand is full of praise for the *Weekend World* team. Professor Fells said producers had rung him on Sunday evenings to talk through ideas and "new angles" for covering the dispute the next week, though he admitted some programmes using one researcher had been rushed, leading inevitably to mistakes.

Some academics said they felt some measure of agreement on some of the complexities had been produced by academics. For example Professor Fells felt himself in line with the SPRU findings and Professor Robinson's work. Professor Minford on the other hand said that the issues somehow seemed clearer in March. "Academics have been tossing stones in the pond ever since creating ripples," Professor Metcalf said the point was not that academics should or can pull in the same direction, but that by illuminating the issues they can help agreement.

On the whole then academics have played their part, but they are slow off the mark. One may well wonder why it has taken so long for some fairly obvious analytical points on the dispute to have been made. For example criticisms of NCB accounting procedures have been voiced for several years, yet only with the coming article in *Accountancy* can we expect a detailed critique. Equally the social cost arguments were only really taken up by academics well after the dispute started. Some research bodies including the Industrial Relations Unit at Warwick University and the National Institute of Economic and Social Research do not plan any special study of the dispute, though some work has been done by the Joint Policy Studies Institute and Royal Institute of International Affairs energy policy programme.

The final chapter of the dispute will have to be left to the historians, among them Professor William Ashworth, formerly of Bristol University, who is writing the final volume of OUP's series on mining. But perhaps the surge of academics into the debate is playing a crucial role in the dispute not so much by forcing agreement as by clarifying the complexities, thus showing there is something to be said for arguments on both sides. Of course such two-sided approaches will hardly please Mr. McGahey.

The Department of Education and Science has taken advantage of that view in its plan to drag the extramural departments into the 1980s by

NEW UNIVERSITIES



Times and tides turn at Sussex

With its novelty long since worn off, and its reputation for glamour and radicalism much toned down, it's possible to see Sussex University more clearly as just one of a number of pleasant campus universities offering multi-disciplinary degrees.

Although the academic organization of the university has been refined and modified in places, today's new students enter basically the system established 23 years ago. The schools of study provide the academic structure, not individual disciplines. Students choosing sociology as their major subject, for example, can opt for one of five schools (African and Asian studies, cultural and community studies, English and American studies, European studies or social sciences) which will determine their choice of "contextual" or subsidiary subjects. Many of these have intriguing titles, such as "The Modern European Mind" and "Concepts, Methods and Values", (the latter with a reputation for great difficulty) and standards of inventiveness seem to have been maintained: I noted "Comparative Epistemologies" and "Disease and Madness" are now being offered by the School of African and Asian Studies.

It's an extremely complicated academic structure, allowing wide student choice and inducing not a few administrative headaches. The theory is that by the third year, each student's different courses will link up to form a coherent intellectual whole. Whether this synthesis occurs or not depends partly on the brightness of the individual student, partly on the guidance offered by faculty in particular disciplines.

In their first year students are given a good deal of care and attention. Personal tutors discuss choice of subjects and a two-term preliminary course is designed to ease the transition from sixth form to degree level work. There is greater choice of preliminary courses now and the exam at the end of the second term has been abolished (very few failed it), but the idea of teaching study techniques and essay writing skills remains the same.

On the arts and social sciences side, tutorials and seminars are still the basic teaching method, although staff students in dent rates have suffered as a result of the university cut. Now four students rather than two share a tutorial and one member of faculty rather than two leads a seminar. But so far moves from

From the swinging sixties to the austere eighties . . .

In an era of retrenchment and uncertainty over future student numbers, it is easy to forget that only two decades ago the talk in higher education was of expansion and experiment. The launch of the new universities was then in full swing as the first 300 students completed the first term at Essex and Lancaster, joining the pioneers of Sussex, East Anglia and York. Kent and Warwick were ready to follow in 1965, with Stirling bringing up the rear two years later.

The establishment of the eight campus universities represented a unique initiative for British higher education since all their forebears evolved gradually from local institutions. Even Keele, the forerunner of the new wave,

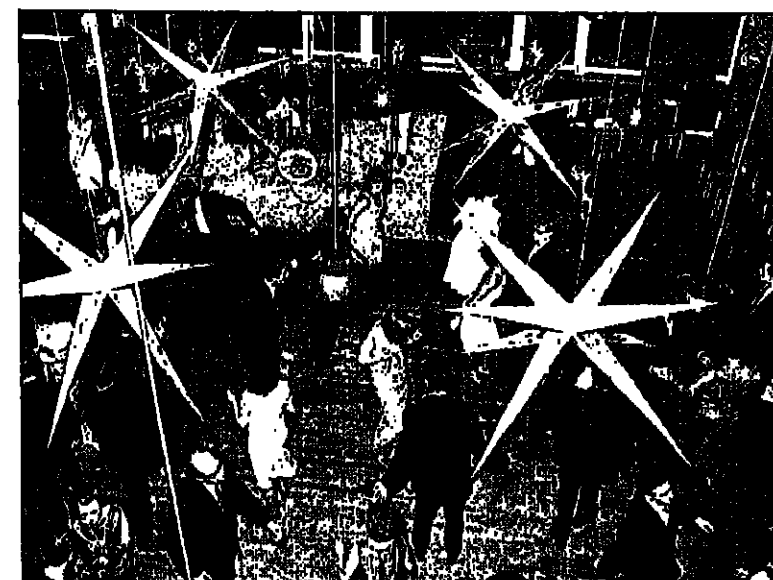
had grown out of a long-standing local initiative based on adult education and external degrees.

The lucky eight were chosen from a field of 31, most breaking with tradition again by basing themselves away from large centres of population. Each was given a target of 3,000 students within 10 years but some, such as Warwick with its ultimate expectation of 15,000 students or more, set out to be much larger. As it turned out, the University Grants Committee's policy in the years of expansion was to promote growth in the older universities and the new institutions generally remain rather smaller than most of their counterparts.

However, although the new universities have come to be identified with the Robbins Com-

mittee's expansion plans, actually the concept was taken on board by the UGC as early as 1959, before the urgency of providing more places had been accepted. The interest was as much in a new approach, academically and organizationally, as in the utilitarian question of access to higher education.

The students, too, were looking for something different from the usual university fare. In a new series, journalists from *The Times*, *The Guardian*, *The Observer* and the *Glasgow Herald* revisit the campuses where they studied in the early days of the new universities. In the first part, PHILIPPA INGRAM, deputy editor of *The Times*, goes back to Sussex University.



A dance held by Sussex students' union in 1964.



Present-day students enjoy the sunshine in a courtyard among the arts buildings.

is noise from neighbouring streets. It looks a rather claustrophobic way to live, but it's a good deal cheaper than renting a flat or room in Brighton - about £16.35 a week including heating and rates compared to £20 to £24 a week in town exclusive of heat, rates and travel expenses. Given that the value of student grants has fallen by about 30 per cent over the last 20 years, this is a major consideration.

There are some 4,600 students altogether (compared to 1,500 in 1964) and room for 1,650 on campus. Second-year students move out into

flats in Brighton and Hove as they always did, but these are scarcer and more expensive. *Living Off Campus*, an information sheet issued by the student union welfare office advises first-years to start looking for their second-year accommodation at the beginning of the summer term. It even mentions squatting as a possible alternative, but adds prudently that this lifestyle needs a "considerable amount of organization, planning and time for repairs etc". To a limited extent the university has tried to alleviate the housing shortage by

buying up some large properties suitable for conversion.

The students' union has become more prominent, but this may simply be a function of the growth of student members and consequent proliferation of welfare activities and union societies. It is more politicized - since the late 1960s elections for union posts have taken place on a slate system, whereas previously aspiring bureaucrats of any or no political persuasion would stand for office. Still the reputation for student radicalism seems no more justified now than then, and it would take a very big issue to get 1,000 students to a union meeting. As well as the mainstream political societies like the Labour Club and Social Democrats there is a proliferation of small political groups with titles such as the Libertarian Socialists or Revolutionary Communist Party. But these tend to undergo subtle changes of name and policy during summer vacations, marking it hard to follow the rise and fall of particular tendencies. Women's groups and gay rights groups, which are well represented, of course had no place at all 20 years ago, back in the dark ages.

The union offices are still in Falmer House, the building which surrounds the courtyard and most that visitors first see. Once the focal point of social life on campus, the old snack bar and refectory and the senior common room have all been dispersed to places which were just part of the general building site.

Falmer House wouldn't be big enough to provide for the increased population but it is depressingly empty - a few desultory students playing on the space invaders (an innovation) and autumn leaves and the odd polystyrene cup floating in the moat. This aquatic feature, it turns out, has proved extremely expensive to maintain, and the section of moat behind Falmer House has been filled in, an unusual victim of the cuts.

Brighton town, was and, as far as I could tell, remains the centre of social life for Sussex students, thought the campus functions as a mini village now. There is the usual programme of societies' meetings, vastly increased sport facilities (where did Virginia Wade practise?) but live music is rare with even a mediocre band charging £800 a night and a good one at least £2,000. Instead there are discos every night except on Sunday. The what's on guide in the union newspaper the term was advertising a sixties night disco. It's good to know that not all the tunes have changed.

The author was at Sussex University from 1964 to 1967 in the School of African and Asian Studies.

Competing for the future

For 60 years the pattern of university adult education has been rooted in the small tutorial class led by a specialist staff tutor. The extramural departments of the 22 universities anticipate that the new change in funding could radically alter that.

Their world, regarded by many who have had to fight for the resources in the market place, has come to be seen as a little too cosy, the effect of the 1944 education act with the growth of the residential colleges, the local authority colleges of further education and the Open University have lessened their importance as an alternative route to education for mature students. In short the tradition is seen as an anomaly.

The Department of Education and Science has taken advantage of that view in its plan to drag the extramural departments into the 1980s by

turning the system of funding on its head. The new funding mechanism proposed in the letter sent out last week is a mechanism based on output rather than input.

Whereas before the DES supported three-quarters of the costs of staff tutors and three-quarters of part time teaching costs of a programme agreed between itself and the extramural department, now the system will be based on students' attendance.

Apart from a proportion of money held back for innovative practice and waiting for departments with particular problems of geographic isolation and class size, the core of the pool money will be distributed on a competitive basis. The extramural departments will be competing with each other for limited funds.

To many this signals a move towards large popular and less de-

Felicity Jones looks at how changes in funding will affect the traditional pattern of extramural teaching

manding classes as the only way to survive. The simulation exercise carried out through the Universities Council for adults and continuing education with the help of six universities to test how the new system would work found that it favoured those with a low number of full time staff, high part time staff and high enrolment.

Departments like Leeds which has prided itself on its high ratio of full-time staff and three year tutorial classes, all encouraged by the Inspectorate, will be knocked sideways. Many who did not prepare for the change will find it hard hence the safety net negotiated with UCACE that no one will have to cope with more than a 10 per cent drop in funds in the first year and the necessity to take London and city universities out of the equation otherwise all the money would land in their laps

within 10 years. Those who in principle openly back a switch to student-centred funding are however concerned about the lack of a well articulated plan for continuing education. Mr. Dick Smethurst, director of Oxford's department, who is a former Treasury civil servant and member of the UCACE negotiating team, thinks it could be a regressive effect.

As he told the conference of Welsh extramural directors in the summer: "We are going to be forced back a hundred years in the early days of the university extension, when underpaid and undervalued staff, part time, but often of high distinction went around from town to town; when the large popular lecture ensured financial survival and enthusiasm from the class after the lecture submitted essays and were awarded certificates."

He does not quarrel with the objective of getting better value for money with the DES exercising leverage to channel activities into priority areas but argues that other means such as using the Inspectorate more rigorously could have achieved the same ends.

The traditional partnership with the Workers' Educational Association will also be threatened because universities will have to demand a higher income or reduce joint classes. Oxford, like Bristol and Surrey, saw the writing on the wall and moved part of the way towards self-sufficiency. It receives £250,000 a year from the UGC and DES and generates £1m itself. But others like Leeds and Sheffield will be in difficulty without the advantages of a "name" which will attract visiting Americans to lucrative summer schools.



Harold Silver

Living in a limbo between childhood and adulthood

In whatever other histories Sir Keith Joseph may have earned a place, he has an assured one in the history of adolescence. The medieval youth was an adult when he was strong enough to bear arms. As a result of the Lateran Council, the age of majority in Britain was reduced to 18. It was different when it all had to do with land tenure or family and house, or rite of passage. It was, and is, different where the tribe or guerrilla warfare dictate other priorities. It was, and is, different for different groups within our own society. The rites and symbols are different. At my barmitzva at the age of 13 I may not have become a man as everyone was busy telling me I had, but it was different in long trousers. And, of course, it was, and is, everywhere, different for girls.

The history of childhood and adolescence is a thriving international industry. The history of adulthood is less obviously a historical sub-branch, but historians, anthropologists, social scientists of all kinds, have eyes on the moments and styles and problems of transition. And on social class differences - nothing how the nineteenth century public school, the expansion of higher education, changing patterns of schooling and apprenticeship, the telephone or the pneumatic tube changed the technological basis of employment, and impacted differentially on social classes, widening gaps between childhood and adulthood. However hard developmental psychologists or human development specialists try to identify them, there are in our society no neat cut-off points at which boys become men, or girls women.

Studenthood complicates it all, and Sir Keith Joseph is making it more complicated. Underlying the way student questions - especially grants - are perceived is a twentieth century view of adolescence not always made explicit.

Adolescence as a "problem period" of human development was invented - mainly in the United States - in the 1890s, first publicized by G. Stanley Hall in 1904, and enthusiastically adopted and magnified by the industrial world for the rest of this century. As childhood and child-centred education gained attention, so did the adolescent cushion against the harsh and dangerous adult world gain footing. As juvenile labour was curtailed, schooling was expanded. As higher education grew and apprenticeship lengthened, the world discovered, and implemented, the need to legislate for compulsory schooling, and longer compulsory schooling. War, the decline of church authority, changing sexual behaviour, and a lot more, "underlined the adolescent 'problem'" and the need for expert responses to it. Books in the 1930s could talk about children "between the ages of 12 and 17". Surveys of children's leisure activities after the Second World War could include an age group up to 20. No one quite knew what adolescence was, how long it lasted (there are enormous discrepancies among the psychology textbooks), but it was here to stay.

The abrupt transition to adulthood in "advanced" societies was no longer by the early thrust into factory employment or by any of the ritual hurdles over which many societies precipitate their young (though we still create adults pretty readily when we need them to shoulder arms). How it all happened has attracted historians into a study of schooling and religion, the Boy's Brigade and the YMCA, industrial skills and the family. Some social scientists have fought back. Frank Murgrove has presented the detailed case against discontinuity of values and

outlook between the adolescent and the adult. In the US, Bennett M. Berger has explored the link between institutionalized adolescence and the expansion of higher and continuing education. What he described a decade ago, Sir Keith will be pleased to hear, was entitled "The New Stage of American Man - Almost Endless Adolescence".

It would appear that whatever changes take place in warfare, or the age of majority, or human development, students remain - in policy considerations - equated with adolescents, if not children. That, at least, is the implication of using government decisions to increase student dependence, to withdraw established practice and policy of providing free tuition in Britain, to increase parental contribution to and control over their young. Nearly 20 years ago I wrote an article for *Universities Quarterly* advocating "Salaries for Students", on the main grounds that students had by the age of 18 an equal right with everyone else of that age to adult status and treatment. I also held the view that the post-school education process - regardless of the social position or future status of the people concerned - was a form of work, or at the very least apprenticeship, and should therefore attract a wage or salary and all the conditions that normally accompany them.

On the streets of medieval Oxford there was immature and adult behaviour, and there still is. There is immature behaviour to be seen in rag days up and down the country, in student bars and college hostels. Some immature behaviour, and a great deal of adult behaviour, as in the adult world as a whole. In student terms we witness the uncertainties of the "almost endless" prolongation of the educational process itself, and of the state of dependence by which the student is defined. In addition to the psychological literature of the "problems" there are other explanations of the adolescent state which policy decisions constantly confirm that students inhabit. J. B. May talks about "social adolescence" which lasts "an indefinite period of time". While the books are being balanced, does it matter whether we are producing an adult society? When student dependence is increased, does it matter that the "indefinite period" suddenly looks longer rather than shorter?

Sir Keith diverts resources elsewhere, antagonises Conservative parents and voters, tampers with three decades of British policy on fees and maintenance, produces a major revolt of Conservative MPs, gets the students out on the streets and staff, pretty solidly behind them, persists in reducing the standard of living of most students and proposes to do the same for more, and starts the process of dismantling one approach to student support, without any hope of access to another.

Higher education goes on being devalued and whittled away - but among the protests about issues of grants and places, and fees, and discretionary awards, and the whole business of access to and support for and in higher education, I want to welcome Sir Keith to his place in the history of adolescence. I am not sure whether the chapter will be headed "Seeing Students as Children" or "Treating Students even more as Adolescents" Or, hopefully, "Joseph's Abortive Attempt to Increase Student Dependence".

Two weeks ago angry placard-bearing students and teachers strode out into the centre of one of Birmingham's busiest highways, with the aim of bringing traffic to a halt. The demonstration was not designed to bring attention to a major dispute over pay or the closure of a popular school. All were engaged in an attempt to highlight the future surrounding the city's plans for a previously relatively tranquil sector - adult education.

That the protest should take place in Birmingham might seem even more surprising, given the fact that its chief education officer for many years was Sir Lionel Russell, chief architect of the Russell Report on adult education in the early 1970s, a document which advocated major reforms, and which became to adult education what the Plowden Report had been to primary schooling of the 1960s.

In compiling the report, Russell drew for inspiration on much of the pioneering work which has already been carried out in Birmingham. Indeed, the city's present adult education network, comprising a dozen major institutes which also disseminate their work through community centres and classes in schools, owes much to his personal involvement.

The Russell reputation in adult education remains so high nationally that to challenge its very foundations in Birmingham would seem, to some, to be inconceivable. Yet it is precisely this ambition, held by a section of the city council's controlling Labour politicians, which has fuelled an outcry from within the service, and created a deep schism of opinion between members of the city's Labour education group and their colleagues.

The present dispute centres around an ambitious plan by the city council's performance review committee to amalgamate and streamline all community provision - sports, leisure activities, youth and community work, as well as adult education - and place it under one administrative department, leisure services.

The proposal has been countered by strong and emotive opposition from the Birmingham branch of the National Association of Teachers in Further and Higher Education which branded the plan a bid to transfer adult education "into the parks department", and has embarked on a programme of petitions, the street rallies and public demonstrations.

Labour took control of Birmingham City Council in May this year, and charged the performance review committee with the task of overhauling the city's leisure provision.

Behind the move was an underlying concern about sports provision in Birmingham and the dual use of school facilities. Four years ago the Sports Council agreed to match Birmingham's multiple masters pound for pound in a bid to improve sporting facilities. Each organization pledged £75,000 to the scheme to upgrade facilities in some of the city's schools and to make them more readily available to the public.

Disquiet surfaced recently about the slow pace at which the dual use scheme has progressed, with the performance review committee now keen to enlarge the programme to embrace what it views to be other recreational functions, including adult education. In overhauling the system it also proposes a programme geared to a 52-week presentation, rather than an adherence to academic terms, and in some instances a pay-as-you-go structure.

Members of the performance review committee maintain the changes will be purely administrative; not only enhancing leisure facilities for the citizens of Birmingham, but also overcoming duplication in staffing and bureaucratic problems associated with the administration of the existing services by two council departments, education and leisure.

Representatives of Nafthe in Birmingham contend the plan poses a dire threat to the future of the adult education service. They argue that it is an integral part of the city's entire education system, and cannot be interpreted as being recreational in character. Placing the system under the supervision of a management team with no knowledge of experience of educational philosophy or provision would be "disastrous".

The union's members have been incensed by what they regard as lack of prior consultation on the issue. Nafthe was first informed of the proposal on September 14, and invited to respond within 48 hours. Having protested that insufficient time had been allowed for proper discussions, the union then learned the performance review committee had approved the plan in principle.



Sir Lionel Russell: Birmingham's adult education pioneer

A question of management

Maggie Richards reports on Birmingham's controversial plans for adult education

ple and instructed officers, including the chief education officer, to prepare implementation plans.

On entering the established disputes procedure, Nafthe found its only channel of communication was with the city's education department, with which it was not in disagreement. More recently, at a meeting with all unions involved, the performance review committee agreed to defer any further decisions on the issue until full responses have been obtained.

For its part, the union claims it would welcome more extensive use of school buildings in Birmingham, and the introduction of a 52-week service. But its doubts about the wisdom of the present proposals emanate from an overriding concern with the financial implications, and a suspicion that the move obscures a cost-cutting exercise which will result in a heavily profit-orientated service.

Quoting an unofficial estimate of £19,000 per school merely to facilitate the opening of premises for adult use, the union says this does not begin to take into account the additional costs of increased use of equipment; of upgrading buildings to meet the needs of adults; and of providing suitable administrative and teaching staff for a 52-week programme.

Concern is being expressed too about an over-emphasis on sport and leisure activities, and a heightened awareness of the profitability of individual courses. There are fears that less popular classes, and those for the disadvantaged, might not be accorded the priority they deserved.

A suggestion that newly formed neighbourhood committees might set institute fees and the supervise the curriculum has led to accusations that a disparate service is being created, with more affluent areas of the city enjoying a superior programme, and able to charge higher fees.

Nafthe also believes connexions with other sectors of education will suffer if the transfer proceeds. Strong links exist with further and higher education institutions through Return to Learn courses, but these and other activities such as educational counselling, could be in jeopardy, says the union.

Inevitably, there are also fears that changes in members' pay and conditions may result from the integration of the adult education service into the leisure department.

Similarly, there are worries about the legal position of Value Added Tax, once adult education classes pass out of the control of the education service. Though the present position on VAT is complicated, in general subsidized courses for strictly educational purposes are exempt.

Councillor Kenneth Barton, chairman of Birmingham's performance review committee remains adamant, despite the objections, that the scheme must proceed.

"The people of Birmingham, through their rates and taxes, are paying for these facilities. We intend to make sure they obtain full use from them," he declares.

"Over the years everybody has paid lip-service to the dual use policy, but the will to go ahead seems to have been absent. In some cases where improvements have been carried out, the work has been done but the facilities have just gathered dust because the community has still not been admitted."

Essentially, says Mr Barton, the matter is a management problem: "We must establish a system whereby one person is ultimately responsible for the entire service and we can say this is where the buck stops."

Through the new local area committees and a joint education and leisure sub-committee at city council level, adult education will continue to be fully represented and its needs met, he maintains.

Mr Barton argues that for adult education in particular the results of the transfer could be extremely advantageous. As a non-statutory service he feels it is currently threatened by the need of the education committee to protect its statutory obligations in the first instance.

An improved adult education service would attract more clients and generate new income, he maintains. In addition, £200,000 has already been earmarked for the scheme, and costings on the anticipated expenditure are currently being undertaken.

Mr Barton may be satisfied about the financial allocation, but his opposite number on the city's education committee, Councillor James Eames, is decidedly unhappy, regarding £200,000 as a mere "flea bite". It has not just been lack of existing resources which has prevented the education committee from fulfilling many of the performance review committee objectives, he explains. Major concern has focused on the spiralling costs of implementing the programme, in particular the increased cost of continual usage of premises and equipment.

Birmingham's Labour education group has also warned that the transfer of some services out of the education system might seriously weaken or damage the remaining provision. The group has put forward its own recommendations for the future, which include the appointment of a coordinator from within the education department to liaise with leisure department officials on the implementation of a dual use policy.

The group has urged a rethink of the performance review committee strategy, and suggested a respite for all sides to reexamine the issue under the auspices of a joint committee and to return to the debate before the end of the financial year.

However, on present scheduling, the performance review committee is due to receive the views of trade union delegations by mid-December, and to take its final recommendations to the full city council in February.

David Jobbins describes the varied role of Cambridge University's botanic garden

A solid branch of academic growth

The process of change in university botanic gardens is slow, steady and largely unswayed by the scientific and cultural revolutions that inevitably rock their parent institutions from time to time. Development is linear, governed by the natural forces, and the temptation to pull things up to study the roots kept firmly at bay.

Cambridge University's botanic garden has been a fixed point to generations of academics and students, bounded on its 40-acre site by Hobson's Conduit and the Trumpington Road.

John Stevens Henslow, the professor of botany who set Charles Darwin firmly on the path to immortality, would almost certainly recognize the outline of the collection he planned and began during his tenure from 1825 to 1860. The famous collection of temperate zone trees that he inspired is still a feature of the garden, and although the oldest trees are 130 or more years old, the systematic arrangement has been maintained by replacing short-lived or diseased specimens.

A strippling compared with Britain's oldest university botanic garden at Oxford, Cambridge can still boast a 224-year history, although it moved to its present site a mere 150 years ago.

Its curators, and since 1919 scientific directors, have sought to maintain continuity while maintaining the three aims of teaching, research and amenity. The garden is now a *mecca* for hundreds of amateur and professional horticulturalists who visit to examine its classified collections of living plants from different origins. Students at all levels come to view its systematic order beds portraying the relationships between 80 families of flowering plants, the ecological displays and the chronological bed showing the succession in which plants were introduced to this country.

Much of the work of the early plant geneticists Sir William Bateson and Dr C. C. Hurst was carried out at the garden, and a considerable amount of plant material is still supplied for teaching and research work in the university.

The rise to the fore of the conservation movement has had its impact too, in the shape of a collection of rare native plants, mostly from East Anglia. Permanently established until recently director Dr Max Walters, until recently director of the garden, in 1976 with the aid of a grant from the Nature

Conservancy Council, the collection is intended as a reservoir of genetically-pure stock as an insurance against extinction in the wild; a source of otherwise unobtainable research material for students; and an important weapon in the drive to acquaint the public with Britain's protected plant species.

Dr Walters was only the third scientific director of the garden since the post was created, itself a vital contribution to the continuity on which the philosophy of the botanic garden depends.

His successor, Professor Donald Pigott, who took up the appointment at the beginning of October, represents a dramatic break with the past. For his predecessors have tended to be distinguished taxonomists, while he comes from another branch of the increasingly complex and fragmented discipline of plant science.

But Professor Pigott, whose scientific interests have tended towards ecological research - particularly into the mysteries of Britain's broadleaf woodlands, is not in the business of introducing dramatic changes to Cambridge.

For a start he is a Cambridge man with a long-standing and well-founded affection for the garden. He studied at Cambridge as an undergraduate before taking his PhD there and moving to Sheffield University's department of botany in 1951. At that stage plant ecology was an approach which was only beginning to find its feet.

The move to the north was welcome, for he had developed strong feelings for his hills and open spaces while at school in the Lake District, an experience which had awoken an interest in natural history, geology and the countryside in general. His research took him into Derbyshire to examine the area's soils and vegetation and before long he had embarked on a study of the generation of deciduous woodland.

One of his projects, into the regeneration of oak woods was begun in 1955 and has only recently been published, an illustration of the long timescale involved in this branch of the science.

Then in 1960 he returned to Cambridge for four years, maintaining his Derbyshire studies while beginning similar inquiries into Cambridgeshire's woodland and soils.

Ecology was now more widely recognized, even among the hard-line geneticists and molecular biologists of Cambridge. It was the awakening of



Professor Pigott: in favour of evolution rather than revolution

what is now a popular mass movement as well as the establishment of an academic discipline. Among his students at the time was that determined defender and pioneer historian of Britain's native woodlands, Oliver Rackham, who has remained at Cambridge.

Then in 1964, a dramatic change in direction. Professor Pigott left the traditions of Cambridge for one of the manifestations of the Robbins era, the new University of Lancaster. He was appointed head of the biological studies school, charged with the responsibilities of getting it off the ground, building a competitive department and recruiting students.

"It was a biology department and I had been a botanist," he recalls. "I very much like the north-west and enjoyed it when I had been at school in the lakes. I was glad to be going back." At first it was tough going, with just six academic staff - the saving grace being that it was a first year course. But it soon expanded, reaching a peak of 25 under Professor Pigott's leadership, now falling back again because of the 1981 cuts.

"It was a very broadly-based depart-

ment. There is an enormous advantage in having a lot of different types of people. I am a great believer in breadth of base."

He feels the tendency for biological science departments to incline to the various approaches - biochemistry, genetics or ecology - should be resisted, certainly at undergraduate level. "Many of the academic staff at Lancaster benefited from the mix of disciplines. The problem can be that being broadly-based makes making a name and therefore attracting research council funds a little more difficult, not that there is any evidence that Lancaster suffered. The department has a very good name in certain fields which grew naturally rather than being forced by a particular combination of people," he says.

Evolution rather than revolution seems set to remain his guiding philosophy at the botanic garden as well as at Lancaster. A naturally reticent man, Professor Pigott is unwilling to be drawn into anything approaching criticism of the way his predecessors have handled the job, or the relationship with the university.

Surveying the garden from his office

window on a murky and damp Cambridge autumn morning, he is full of praise for former directors. "The second director, John Gilmour, did a wonderful job when he took over the second half of the garden after the war. I hope to perpetuate this. I also want to fill some of the gaps in the collections, and we have some old, rather decrepit specimens of ash and we should consider replacing them. We should be planting youngsters for the future."

"Each of my predecessors has done something really worthwhile. Probably one of the benefits of having changes in direction is that different things are seen as important each time but this does not mean things already done are not important," he adds.

His principal aim is to increase the amount of scientific research already undertaken in the garden. There is scope for a little during too, he believes, trying to establish plants generally regarded as unsuitable for the climatic and soil conditions. Crop plants are underrepresented and he believes the garden could play a vital role in showing these to students and the public.

"But we should know where we are going - we cannot grow everything and should grow things with some degree of purpose," Professor Pigott says. "The garden is much more than a park and this should be made clear. The amenity value will always be high, but the message should be clear: this is an important collection of plants with an educational and scientific function where we learn what can be grown and how it grows. All my predecessors have done this and I want to continue to do so."

The garden has always been regarded as an important teaching resource by the university, and he believes this role can be expanded. "I would like to feel undergraduates will come here, not only under guidance, but by themselves and browse around as if they were in a library, finding their own way around."

In some ways the return to Cambridge has been a wrench for it meant leaving his beloved northern hills and lakes. "I am very fond of the countryside and quite apart from my work I like walking in it and exploring. There is a lot I positively dislike in East Anglia, particularly in the Cambridge region. It is too agricultural and smoothed out for me," he says.

Professor Pigott is a member of the council of the National Trust and is deeply concerned at the lasting damage being wreaked on the countryside, particularly in East Anglia and the home counties, not only by modern agriculture but by other human pressure. The wider educational role of the garden will, he hopes help people to understand plants and their needs, and the importance of protecting them.

university's budget."

One cloud on the horizon which is worrying many BUAC members, however, is the recent emergence of the Higher Education Accommodation Consortium.

This was formed in 1981 by a group of 27 polytechnics and colleges of higher and further education to do the same job that BUAC is doing for universities. The colleges had tried to join BUAC but were not accepted into membership. Now HEAC has 50 members and distributes 20,000 copies of its brochure.

"The main difference between us and the universities is that few of our members have more than 1,000 beds on one site and so we cannot take the really big conferences but there are not many of those anyway," said Jill Stanforth who runs HEAC from offices at Sheffield Polytechnic.

In addition to the conference business, HEAC members are offering holidays including children's rugby holidays at Sheffield and canoeing at Portsmouth and educational holidays on subjects such as painting and the art of leaded windows. Members pay £300 to join and £300 a year plus 35p per bed up to £600.

Jill Stanforth is convinced that the market is big enough for everyone if it is carefully developed and she believes there is still a tremendous selling job to be done overseas.

Richard Hainsworth of York University is not so sure. "We all glibly assume that the business is here to stay. I am confident personally because people will always want to visit York. I am not sure this is the case for all BUAC members. I am not too worried about HEAC but some of the other universities are quite upset about it."

Getting away from it all on campus

Sandra Hempel on universities in the holiday and conference market

work was to tell the growing world of conference buyers that universities exist as venues, that they have beds, conference rooms and equipment, and leisure facilities available at competitive prices and that they have the necessary expertise to handle a professional conference.

According to Roger Lloyd, who is in charge of the University of East Anglia's conference facilities, the basic message that universities are out there in the market is getting across slowly although, he says, it is still a surprising struggle to make buyers remember.

One drawback has been the universities' institutional image which has tended to discourage all but the more basic, low price events. Now, however, there is a move to compete more directly with the hotels, particularly on catering. BUAC says its members are improving their kitchens, restoring restaurants and offering brighter menus.

Warwick is boasting dishes such as crayfish with dill and brandy and Tournedos Dubarry on its *la carte menu*, while York is including waitress service in its standard conference package and Goldsmiths, London, is promising great things since the recent appointment of a former Thames Television catering manager.

There is also a new wave of theme dinners including Goldsmiths' East End supper with jellied eels, Essex's oysters and Brindford and York's "Yorkshire Neets" with roast beef and Yorkshire pudding.

BUAC members pay a £200 annual subscription but most also produce

their own brochures. Universities tend to be coy about the amount they spend on selling their facilities as well as about the amount the revenue contributes to their budgets.

According to Roger Lloyd some universities spend tens of thousands of pounds on marketing but more are like the University of East Anglia, he believes, in concentrating their spending through BUAC and their local tourist offices. Lloyd spends something over £2,000 a year on generating around £500,000 income. "I do, however, spend a lot of my time on it and this is probably the major expense."

Lloyd is UEA's accommodation officer but he is also responsible for selling the university's beds and conference rooms.

The money raised, however, is no longer simply a welcome extra. For many universities, faced with huge spending cuts, it has become an essential income used to meet maintenance and repair bills and to subsidize student rent and food.

Robert Watson, who is Edinburgh University's steward and BUAC's chairman, says that it is rare for him to spend five figures on publicity but that vacation letting has allowed the university to freeze student residential fees for three years as well as to improve the standard of student accommodation.

According to Barry Watson, domestic bursar of the Royal Agricultural College, vacation letting is "what makes life tolerable."

"Everyone is looking more closely at

expenditure and income all the time. The stress on an establishment like ours would be immense without letting," he said.

A new BUAC venture is the Holiday Opt-In scheme which is backed by 17 universities. This is aimed at the holiday market and those members whose accommodation and location will attract family holiday business are spending an extra £1,000 a year each on a colour brochure and national newspaper advertising. With prices at around £25 per person per week, university flats compare well with the more traditional holiday apartments.

Last year we sent out 15,000 copies of the brochure," said Roger Lloyd, who is offering self-catering flats both on campus and in the centre of Norwich. "It is really only a toe in the water at the moment."

While the accommodation managers and bursars who have responsibility for vacation letting are convinced of its value, some are concerned at the lack of recognition among academics.

"In many ways, vacation letting has been an overnight success that has surprised us all," Robert Watson said. "But have we persuaded enough people in the educational world to help us keep the show on the road?"

Richard Hainsworth at York, who spends £3,000 a year on promotion and turns over £1.4m of business a year, says it is a difficult task to run the conference business without annoying academics. "They tend to think of it as an inconvenience but we are talking about a major contribution to the

Educating for democracy

In 1964 when João Goulart was president, democracy in Brazil, ceased with the advent of a military coup. It is still governed by the military and their current president, General João Figueiredo, was chosen by them. Next year on January 15 the president will be elected by members of an electoral college (Colégio Eleitoral).

Abertura ("Opening") was initiated in 1979 by General Figueiredo and tacitly acquiesced by the military. It gave freedom to the press and permitted the return of political refugees; the charismatic Leonel Brizola, now governor of Rio de Janeiro, was one of these. It also allowed the formation of new and more wide ranging political parties. There are now four legal opposition parties namely, Partido Movimento Democrático Brasileiro (PMDB) whose presidential candidate is Tancredino Neves, Partido dos Trabalhadores (PT), Partido Democrático dos Trabalhadores (PDT), and the Partido Trabalhista Brasileiro (PTB). The government party, called the Partido Democrático Socialista (PDS), has recently elected the ex-governor of São Paulo state, Paulo Maluf, as their party candidate for the presidency.

In reality the PMDB is the opposition party and there is a straight fight between Tancredino Neves and Paulo Maluf for the Palácio do Planalto or Brazil's equivalent of the White House. This fight will culminate with 686 votes being cast at the electoral college which will decide who is to be the new president of Brazil.

Brazil's system of government is similar to that of the United States of America. There is a federal government but at the same time each state has considerable power in its own right.

There are two chambers, the Senate (Senado) housing the Senators and the Federal Chamber (Câmara Federal) containing the federal deputies. The latter is essentially the second chamber; the main power resides in the

Sean McKee looks at the run-up to the Brazilian presidential election

Senate some of whose members have been selected by the government and some elected directly by the people. Congress is the union of the two; it would tend to deal with constitutional matters. The present electoral college was formed at the initiative of Figueiredo and is a rather complicated amalgam of votes which is generally thought to favour the government, that is the PDS.

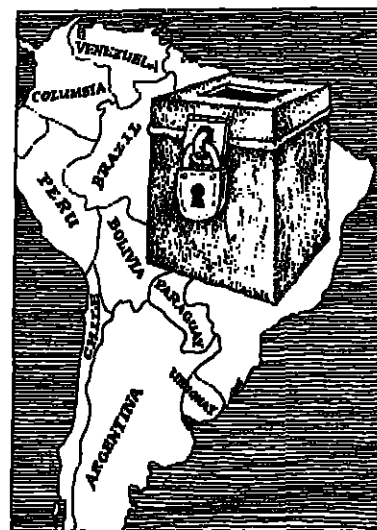
For instance the north east, because it comprises some half dozen small states, has not far off 50 per cent of the votes in the electoral college. But the north east tends to support the government. This is largely because of the extreme social structure; there tends only to be rich or poor people and if the boss tells an illiterate and politically unaware worker to vote for a PDS state governor, they generally do.

In other words the government is relying, although it would most certainly deny it, on the political ignorance of a large number of the Brazilian people. This then explains the huge political rallies that have taken place throughout the country since the beginning of this year. The opposition parties, and in particular the PMDB, are attempting to educate the people politically. For instance on January 25 there was the largest political demonstration for 20 years at Sé in São Paulo. This was followed by the largest demonstration ever in Brazil in the Avenida Presidente Vargas in Rio de Janeiro on April 10.

Indeed there have been demonstrations, all of them peaceful, in most of the major cities. These have been harmoniously organized by the opposition parties which have been careful not to personally attack anyone within the government.

These demonstrations underlined the strength of feeling among Brazilians for direct elections and amendments to the constitution to establish direct elections for the presidency have been put forward, but have so far been defeated. However this government's success was followed by a shock result. In the June elections for the city councillors (*prefeitos*) at Santos, Brazil's major port, the PDS incredibly only received 3 per cent of the votes. Furthermore, when it became clear that the PDS candidate for the presidency would be between Paulo Maluf and Mário Andreazza, a breakaway group within the PDS was formed calling themselves the Liberal Front ("Frente Liberal"). At the beginning of August 52 parliamentarians met in the house of the vice president of Brazil, Aurélio Chaves, to do a deal with Tancredino. If Tancredino would accept Senator José Carneiro, who had been president of PDS only 100 days ago, as candidate for vice president of Brazil then he would have their support. Tancredino accepted their proposal so forming an alliance for a government of national unity.

Perhaps the main reason for the government's lack of popularity is economic. Inflation is rocketing at above 200 per cent and increasing but salaries are not augmented at this rate; a law requires that salaries in the public sector do not increase by more than 80 per cent of the rate of inflation. In part this is due to the restrictions imposed on Brazil by the International Monetary Fund (IMF). Brazil's loan is in dollars and the rate of interest payable is related to the American interest rates. Thus it appears to the Brazilians always to be increasing and there is a deep sense of public outrage and resentment against the IMF. A recent opinion poll suggested that the hardest



and most important task facing any new government would be, not inflation nor unemployment, but the renegotiation of Brazil's external debt.

Although a year ago Figueiredo was opposed to the candidature of Maluf the political strength of Maluf has grown and he was overwhelmingly elected as the party candidate for the presidency on August 14 beating the minister of the interior, Mário Andreazza, by 143 votes. Figueiredo has endorsed him as the official candidate and his task is now to unite the PDS. But in fact his very election has had the opposite effect. Apart from the Liberal Front there are now a number of members of the PDS who have come out publicly in support of Tancredino. Possibly one of the more significant is Antonio Carlos Magalhães, ex-governor of Bahia, a powerful man with 21 votes at this command in the electoral college; he had previously supported Andreazza.

The reason it is unlikely that Maluf will be able to unite the party lies in the man himself. Aged 52, he is a strong man, clever and ruthlessly ambitious. He has made his money as an entrepreneur. When he was governor of São Paulo some years ago and he visited

São Carlos, the students lined the streets chanting: "Trombado, Trombado, Maluf é um Ladrão" which, translating loosely, might read: "Small street thief, large street thief, Maluf, you steal from everyone."

He is at the moment under investigation for financial irregularities incurred during his term as governor of São Paulo state.

The man he is competing with, Tancredino Neves, is a 74-year-old ex-governor of Minas Gerais. A lawyer and a man of immense political experience, he looks well for his years. He is a clever politician with a quick wit and has a reputation for being "clean". It is not therefore surprising that a recent popularity poll gave him 63.3 per cent compared with 21.2 per cent for Maluf. A moderate, he is astute enough not to call irrevocably for direct elections immediately and is prepared to fight for the presidency through the electoral college. He has, of course, once president, pledged to hold direct elections and there is every reason to believe he would.

Tancredino or Maluf? If there were direct elections Tancredino would most definitely be the people's choice. But there are only indirect elections through the electoral college. On the one hand with the breakaway splinter groups from the PDS forming an alliance with Tancredino he is probably at the moment the favourite. On the other hand with the electoral college biased to the advantage of the government and with Maluf's energy and, above all, money it is still an open race. If, however, an amendment for direct elections for the presidency were passed in Congress the rules of the game would change dramatically and Brazil would change dramatically and Brazil a country of 130 million people which is larger than the United States if Alaska is excluded, would in all probability join the world club of democratic nations within the next few months.

The author is coordinator of the University Consortium for Industrial Numerical Analysis. He has worked in Brazil every summer since 1974.

Truth and the gold standard

One of the striking features of current monetarist policy, insofar as it affects education, is the interest in promoting "hard" science and technology. This has rather more cutting edge than the limp pragmatism of the Wilsonian era. There has been, in the past, an almost symbiotic relationship between monetarism and changing concepts of scientific truth.

For example, the period of European scientific hegemony, 1660 to 1914, coincided with a long period of monetary stability, sandwiched between the massive inflations of the sixteenth and twentieth centuries. But it can also be viewed ideologically. Early scientists tended to adopt a monetarist perspective, even when their culture was inflationist in tendency.

Throughout the history of science, two rival concepts of truth have been continually intertwining. There are those who believe in the possibility of objective truth, beyond the mere web of human discourse. There are others who believe that truth is simply a convenient name for the locus at which the web of discourse is intersected by consensus or accurate prediction. The latter view has tended to dominate the twentieth century, from the positivism of the 1900s to the paradigm and structures of the 1960s and 1970s. But between 1660 and 1914, the golden age of modern science, it was belief in objectivity which sounded the dominant note.

It would be misrepresenting such a modest epistemology as the discourse theory to describe it as a dogma. So much so, that twentieth century historians of science have been known to criticize Copernicus, Kepler, Galileo and their supporters precisely because they rejected the discourse theory of truth completely. But the laws of progress, which made Stephenson's Rocket superior to the rackhorse and the advanced passenger train so manifestly superior to the Rocket, do not apply to theories of truth as they do to technology.

Despite its popularity in recent times, the discourse theory of truth is extremely fragile. It seems to have

been held by the Babylonian astronomers. They achieved a degree of mathematical complexity, quite astonishing for their time, which enabled them to draw up the first accurate astronomical tables. But their theories, rather like those of modern particle physics, must have been quite baffling for the lay person. They dispensed with the need for objective physical representations of the heavens entirely. In the same way, the storehouses of the priests were filled with bars of unmined bullion.

The Greeks, on the other hand, whose civilization depended on coinage, created the idea that natural truth could be objectified in modern terms of accuracy. There is evidence to link the Pythagoreans, with whom both the atomic and the mathematical exemplars of truth originated, with the introduction of a gold coinage to Italy. The medieval west, which had no effective gold coinage, taught a nominalist theory which applied equally to ratios of astronomical circles and ratios of base to precious metals.

Although physical truth, like gold, must be regarded as operationally inaccessible, the flat of mint-owner or professional astronomer took its place. Just as wages and prices were to be determined by public regulation, so the value of the currency was fixed by decree. If there were a great variety of mints, there was an equal variety of competing astronomical theories.

Just as there is an affinity between monetarism and objectivism so there is a relationship between acceptance of the discourse theory and willingness to accept a token currency whose value has been fixed by the state, and which is subject to continual inflationary variation.

But epistemology is not purely a function of the economic infrastructure. Oresme and Copernicus, living during periods of rapid inflation in the fourteenth and sixteenth centuries respectively, wrote treatises promoting a monetarist blueprint for society.

Some of Copernicus' points have contemporary rings. "At first nations began to mint money, and then they began to lose it."

government balances its books and pockets the profits from recoinage. The manufacturers can put up their prices and even increase profits. The workers through their combination force up wages. But in a land like ours, so dependent on the export and import trade, the long term result is disaster for everyone - except the handful who understand speculation in precious metals."

There is a clear relationship between the concern to establish an objective standard in the currency, and the quest for a heliocentric astronomy.

Copernicus regarded the earth's orbit round the sun as a natural measure: an objective ratio, or standard, by which the competing systems of the day should be tested. Like Oresme he made an equation between gold and the sun, which was rooted in alchemical tradition. But he related both to that "hidden gold", infused into Nature, which determined the regularity of all its natural laws and periodical rhythm. His condemnation of this "alien centre" sounds very similar to his critique of how debased coins drove the others out of circulation.

Gresham's law, that good money is driven out by bad was therefore the work of Copernicus, rather than Sir Thomas Gresham. Copernicus had arrived at it by very similar methods to those employed in his astronomy "by treating experience as the master of all things". He drew up tables of the ratio of copper to silver in the coinage. He linked the debased coinage with the collapse of cultures; "craftsmen, science, works of art" were all exported by inflation.

Gresham applied his law even if he did not invent it. His will created a new educational establishment, Gresham's College, to promote the science and new technology which had been neglected by the traditional universities. To quote J. B. Priestley, "We have been here before."

William Makin

The author formerly taught at the Centre for Medieval and Renaissance Studies, Oxford.

Blacklegs or moderates: Geoffrey Alderman looks at the history of strike-breaking in Britain

"Many of those who have come into the trade unions in recent years, not always with the object of helping forward the great principle of collective bargaining as between employer and employee, but often with the view of diverting their funds and machinery from a purely industrial to a political purpose, have shown no respect for the services who have grown grey in the service of their fellow-workers, giving untold effort, patience, courage, and self-sacrifice to overcome the enormous difficulties that had to be faced in the early days, and who are now justly proud of the splendid structure that has been so painfully and laboriously built up."

These words echo meticulously the views of many moderate trade unionists whose support a militant, politically-inspired agitator is now seeking a little thin. But the alienation of trade union members from guerrilla tactics is neither an adjunct of "white collar" unionism nor a result of what is cheekily called "embourgeoisement".

The words quoted above form the opening paragraph of a little book, entitled *Sane Trade Unionism*, published just before the First World War and written by Walter Victor Osborne, an employee of the Great Eastern Railway and the secretary of the Walthamstow branch of Amalgamated Society of Railway Servants. Osborne was a dedicated trade unionist but he was also a Liberal Party member, and he objected to part of his weekly subscription to the union being applied to the support of the Labour Party. He took the union to court and in December 1909 the House of Lords declared that in supporting a political party the Railway Servants had acted *ultra vires*.

Legacy of the man from Walthamstow

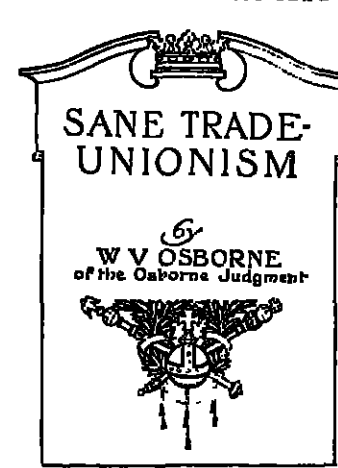
In the Labour press Osborne was immediately denounced as a traitor to his class and a tool of the capitalists who, it was alleged, had manipulated him for their own ends. But Osborne was probably more representative of Edwardian working class opinion than James Keir Hardie. Osborne regarded the rhetoric of class warfare as both irrelevant and dangerous, and he viewed the spectacle of a political organization sponsoring MPs (and, therefore in the age before payment of MPs, having the power of financial life and death over them) as an affront to the constitution. He was a champion of freedom of expression and an opponent of the notion (entrepreneurial in origin) that he who pays a Westminster piper must be able to call the tune.

In agreeing with him, Lord Justice Fawcett declared that an MP "cannot be deprived of his independence, nor can he free himself from the great duty to the country that he undertakes by becoming a member". This view has been upheld ever since. From time to time trade unions have attempted to discipline MPs whom they sponsor; such action has invariably fallen foul of the Commons' Privileges Committee. How many parliamentarians realize that the railwayman from Walthamstow is one of those whom they much thank for the freedom they enjoy?

Among historians of the British working classes, however, Osborne is no hero: he enters upon the story as a grey cloud, blown away by the 1913 Act which restored the political levy but permitted "contracting out." Research into the history of working class attitudes towards trade unionism has been dominated by the endeavours of those committed to the movements. This has brought, without question, enormous benefits in terms of enthusiasm and empathy, but I believe it has also led to a certain narrowness of approach which has, in turn, given rise to a major misinterpretation of the part played by trade unions in the lives of ordinary working people.

To begin with, it is a stark fact, which few of the standard paperback texts seem to take on board, that a majority of British workers has never belonged to a trade union. In 1901, when the size of the British labour force was about 16.3 million, the total number of trade union members was only just over two million. Even in the late 1970s, when trade union membership exceeded 12.7 million, this was still less than half the labour force.

To present students with a view of British working-class development over the past hundred years while ignoring this fact is - I would suggest - intellectually dishonest. But historians



From left, Walter Osborne and the title page of his book, *Sane Trade Unionism*, and William Collison, founder of the National Free Labour Association



Police help a coach carrying working miners past pickets at Whittle Colliery near Amble, Northumberland

Working class heroes?

are, whatever they may protest to the contrary, deeply influenced by their own times. It may be that the present divisions within the mining communities will lead students of the working classes to reexamine their own conceptual approach to understanding and explaining the historical development of working class attitudes in Britain.

To help in this task, I want to examine briefly the phenomenon of strike-breaking. The various terms - blacklegs, scabs, and so on - by which strike-breakers are known are not merely insulting in themselves, but have been taken over by historians and offered as a substitute for true explanations of reactions by one-section of the working classes to actions by another.

In his account of the collapse of New Unionism in the early 1890s, James Hinton (*Labour and Socialism*, 1983), writes: "The Shipping Federation put the organization of blacklegging on a scientific basis and were able to dispatch large numbers of men to break strikes wherever they might occur." Who were these "blacklegs" and why did they wish to break strikes?

In his standard *History of British Trade Unions* Henry Pelling gives us a little more detail, in particular mentions the National Free Labour Association and its founder, William Collison. Acknowledging that Collison was "a man of intelligence and determination", Dr Pelling nonetheless asserts that he "was largely supported to begin with by the Shipping Federation, but in later years the railway companies seem to have supplied most of his funds". In fact I have examined the records (none of which were ever meant for public consumption) of the Shipping Federation and the railway companies, and have found evidence only of the most modest financial support for Collison's organization. We know a great deal more about

Collison than about most "blacklegs" because he wrote his autobiography, released a high public profile, and because his association boasted a record in which its activities were recorded. As with any historical record these documents must be examined critically and, wherever possible, tested against other evidence. Yet, when we have discarded the doubtful statements and the palpable untruths, we are left with a substantial body of irrefutable data about the extent to which the working classes resisted militant trade unionism at the turn of the century.

It is clear that the claims Collison made, in his autobiography, in respect of the success of the association in fishing militant trade unionism were highly exaggerated; if, between 1893 and 1913, the NFLA did indeed take part in 682 "pitched battles with aggressive trade unions", the bulk of the disputes were certainly small-scale affairs, many involving unskilled or semi-skilled workers. However, Collison's intervention in the Taff Vale Railway dispute (1900) was dramatic. The attempt by the Railway Servants to induce his "free labourers" to break their contracts with the company led directly to the momentous legal judgement (December 1902) that deprived trade unions of immunity in respect of civil actions arising from their industrial activities. Collison was appalled at the action of the Liberal government in restoring this immunity (1906), and we may be sure that he would have approved of the partial destruction of it by Mrs Thatcher's administration, and of the restrictions placed by the

Union, he tried (1890) to find casual work in the docks, but was refused employment because "I could not show my trade union ticket".

It is clear that the harsh operation of the closed shop marked a turning-point in Collison's life. He began to examine the *modus operandi* of New Unionism - "strikes, intimidation, boycotting, and unlawful picketing" - examples of which he claimed to have found in abundance in the London riverside unions created by John Burns, Ben Tillett and Tom Mann. More significantly, he made contact with other alienated trade unionists (including disenchanted veterans of the 1889 dock strike). With their help, on May 16 1893, he called a "General Conference of men interested in Free Labour" at Aldgate; at this meeting the NFLA was formed.

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Conservatives upon the closed shop and secondary picketing.

The NFLA continued to operate after 1906, but at a lower pitch. A government announcement in 1912 that unconditional protection would no longer be given to free labourers further restricted its activities, an the need for wartime collaboration between unions and government brought the activities of the association to a vital standstill from which it really never recovered. The last we hear of it is during the 1926 miners' dispute, when it gave assistance in preventing the pilfering of coal supplies.

Yet the importance of the association went beyond the impact of its physical interventions in industrial disputes. Every time Collison was asked, by employers, to provide free labour, he in turn was dependent upon men coming forward to provide this service. The strike-breakers whom he recruited were not middle-class pen-pushers in search of a little excitement as were to be observed during the General Strike; they were men whose credentials were every bit as proletarian as those of the TUC leadership.

So the activities of the NFLA tell us something about the much-vaunted idea of "working class solidarity" in late Victorian and Edwardian Britain. Indeed, although Collison's activities diminished considerably in the 1920s, there is a comparison to be made between his outlook and that of George Spence, the militant Labour MP who opposed the continuation of the miners' dispute in 1927 and formed a breakaway "non-political" Miners' Industrial Union in the Nottinghamshire coalfield. I wonder whether it is right to dismiss this body as a "company union" - whatever that might mean. It flourished between 1927 and 1937 as a genuine expression of moderate feelings in a coalfield which then, as now, experienced prosperity and growth. In 1937, on the initiative of the government, it was brought under the umbrella of the Miners' Federation. Judging by recent events in the East Midlands, its ideas seem to have survived largely intact.

The deep divisions within the NUM

Historians who write about the miners' dispute of 1984 will have no difficulty in pointing to the deep divisions within the National Union of Mineworkers, and between the NUM and other sections of the trade union movement: these divisions are fully documented and we see them, and their tragic results, nightly on our television screens. However, we need to approach these events in a historical perspective. The advocates of militant, resented trade unionism have never commanded majority support even among manual workers. The heroes of British trade unionism have been moderates: Ernie Bevin rather than A. J. Cook; Frank Chapple rather than Frank Cousins.

Thus, while acknowledging the important part that unions have played in strengthening the economic and social status of working people, we need to remember that the centrality of the unions in working class life has always been more imagined than real. If this was true a hundred years ago, the dangers and hardships of some occupations imposed their own code of loyalty; it is much truer today, when numbers employed in dangerous trades is diminishing absolutely and in relation to the total workforce.

But those who relish the prospect of a much-weakened trade union structure in Britain ought not to draw comfort from this outcome. Many men and women who joined unions at the turn of the century did so because they looked to the unions to provide a means of social expression denied to them as unfranchised citizens: the internal democracy of the unions was itself a rebuff to the lack of democracy at the polls. If this internal democracy has on occasion been grievously abused, there is certainly no evidence that people have turned to political parties to redress the balance. A government elected (as the present one was) with the support of less than a third of those entitled to vote is hardly in a position to gloss over the diminished status of trade unions in the Britain of the 1980s.

The author teaches politics at Royal Holloway and Bedford Colleges, University of London.

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Data double talk

For some of my colleagues, the provisions of the Data Protection Bill seem to be creating problems. Because this bill requires information kept in computer retrieval systems to be made available to anyone whom it may concern, they feel inhibited in including any critical comments in the references they write for their colleagues or students.

I can reassure them that the problem can be sensibly diminished by a little applied terminology. There is no doubt in the mind of either the sender or the recipient as to what the following coded phrases actually mean, but I defy the most ingenious lawyer to find evidence of libel.

STUDENTS

1. "He remains very active in union matters." (He still spends all his time collecting money for the National Union of Miners.)
2. "He has now fully recovered from the problems which prevented him from giving of his best in his first year." (He is still as dotty as ever, but we don't think he will do any better on social security.)
3. "The wide range of his external activities does not prevent him from enjoying good relations with the academic staff." (He comes to one tutorial in seven, and hands in just enough written work not to be kicked out.)
4. "He is virtually certain to get a good, solid 2:1." (He is very dull.)
5. "He writes a good, legible hand." (He is even duller, so much so that I can think of nothing else to say about him.)
6. "His first came as a surprise to nobody." (He nestled in with questions throughout his final year, and spent the rest of his time going through old exam papers.)
7. "He can always be relied on to make a contribution to a tutorial group." (He is a compulsive talker.)

COLLEAGUES

1. "He has a genuine gift for conceptual innovation." (Do not let him get within 10 yards of any sensitive equipment.)
2. "The constant originality of his ideas has never prevented him from receiving support from his colleagues." (He is a persistent, self-opinionated bore. People will do anything to get him off their back.)
3. "I recommend him thoroughly as a person experienced in every aspect of our work." (I am glad to get rid of him before he steals my job.)
4. "He is a good college man." (He last read a book in 1973.)
5. "He is nobody's fool." (He is totally negative in his approach, is neurotically suspicious of other people, and has never done or said anything original in his life.)
6. "He is remarkable for his ability to make specialist findings available to the outside world." (He spends all his time at the BBC.)
7. "He enjoys an exceptionally full and satisfying private life." (He has so many children and stepchildren from his various marriages that you never see him in the department.)
8. "He gets on especially well with his younger colleagues." (He is a raging parthenophile, who must under no circumstances be left alone with anyone under 26.)
9. "In spite of his own exceptionally well-developed critical sense, he is fully capable of accepting suggestions from any source." (He will destroy other people's ideas and then present them as his own.)
10. "He came to us with the highest recommendations." (Someone sold him to us before we had time to suss him out. For "he" read "she" throughout.)

Philip Thody

The author is professor of French literature at the University of Leeds.

On changing the ethos

During the recent symposium on higher education at Lancaster (reported in *The Times* on September 7), John Ashworth raised helpfully the subject of institutional ethos, as it bears on the relationship of higher education in Britain to the economic and social needs of the country. He drew upon the writing of Patrick Nutgens (*THES* *pastim*) in pointing to the important historical role of the Mechanics Institutes as at once an expression of the manpower needs of industry in the nineteenth century and a pointer to the limitations, in relation to the world action, of the detached concern of the universities with liberal education. Ashworth also emphasized (following Birch, OECD, 1981) the persistent importance of the duality of pure and applied "traditions" in higher education in Britain and the difficulties hitherto in relating them effectively. It was surprising that Ashworth did not find it appropriate to pursue the development of the role of the mechanics institutes through the emergence of a strong public sector of both further and higher education now led by the polytechnics. The polytechnics were, of course, established to strengthen that tradition in higher education which is concerned with developing the relationship between scholarship and the world of action; and they have for the most part made substantial progress in so doing, notwithstanding serious administrative and financial impediments to fully effective action, described long since by Alex Smith.

Ashworth appears to have in mind very much the achievements and ethos of the polytechnics, not least in leading his own institution, the University of Salford, successfully towards a more explicit and interactive relationship with industry, commerce and the professions. In so doing he does, of course, have the great advantage, as a vice-chancellor, of working within an administrative and financial framework which (with all its shortcomings) provides the freedom of institutional action appropriate to achieving change. At Lancaster, Ashworth was concerned with ends rather than means. This article seeks to further the discussion by pointing to some of the difficulties as well as the possibilities in changing the ethos of institutions of higher education. It does so on the basis of recent conversations in Scandinavia, West Germany and France with policymakers within both institutions and government agencies.

Problem-solving is a high-level intellectual pursuit

It is of the greatest importance to the well-being of higher education that its ethos, as perceived by the public and by the governments which they elect (both central and local), is consistent both with meeting the responsibilities of scholarship and with discharging responsibilities as an expensive public service. It is unnecessary to detail the nature of the perceptual gap which has arisen. It is, however, necessary to note that as academics we must accept a significant part of the responsibility, and we do well to note that, in a number of European countries, governments are seeking directly to influence academic policy.

Both West Germany and France have, for example, instituted committees on curriculum reform. In France the government, taking note of the effectiveness and high standing of the *grandes écoles* and the success of the relatively new *instituts universitaires de technologie*, is developing policies designed to achieve a greater degree of "professionalization" of higher education in response to a high level of unemployment among university graduates.

A more generally responsive institutional ethos in Britain is likely to be helpful in preserving the necessary degree of autonomy by higher education and in making the case for the financial support necessary to develop more fully the country's intellectual resources.

Institutions which are primarily concerned with the advancement of knowledge rather than with its application, and with teaching and learning within this context, exhibit two characteristics in particular which tend to inhibit a change in ethos towards a more responsive concern with the world of action.

First, they are preoccupied with

With a Green Paper imminent it's time institutions gave some thought to their role, writes William Birch

with the pursuit of universal and theoretical issues and in so doing can operate successfully within a relatively closed system of international research. The second, and derived characteristic is a substantial concern with teaching through highly-specialized, commonly discipline-based courses which flow naturally from a primary concern with basic research. Institutional and individual professional advancement become closely associated with the development and maintenance of this relatively closed system of research and teaching. And it is of substantial interest to observe the tensions created in some of the new universities in northern parts of Scandinavia which are understandably concerned to develop their national and international standing through research which has universal currency, but are expected also to operate within a policy context designed to produce a close involvement in the economic and social development of the northern regions.

In the context of mass higher education, the notion that "learning in the atmosphere of research" (Edward Boyle) provides, without qualification, the most effective means to the general and applicable development of the powers of mind of the student, is difficult to sustain, except in regard to some of those who will become academics. Moreover, it is not necessarily clear that it is the most fruitful general and developmental approach to learning.

Discipline-related courses (as noted by Paul Hirst) are by their very nature concerned with theoretical issues relative to these subjects. The broader conceptual and procedural relevance of these issues is less certain. It is useful, therefore, to look for an approach to developing the general powers of the mind, which transcends disciplinary boundaries at a higher level of abstraction.

In so doing, it is perhaps most appropriate to focus on the notion of problem-recognition and problem-solving as a high-level intellectual pursuit, whether the objective be the advancement of theory or the creation of understanding as the basis for action in the learned professions or in matters of public policy.

R. F. Dearden has recently arrived broadly of the same conclusion; and substantial support is, of course, available from the writing of John Dewey, Jerome Bruner, A. N. Whitehead, Richard Pring and others. Michael Polanyi and Edward de Bono have stressed the central role in conceptual thinking of defining and bridging gaps in understanding. Karl Popper has argued (*pace* Peter Scott!) that there are no subject matters "but only problems"; and again "we do not start from observations but always from problems" - either from practical problems or a theory which has run into difficulties.

In academic life we are accustomed to judge the research of our colleagues by the clarity with which the problems are defined and the rigour with which they are pursued; our graduate students are expected to prepare research proposals in which issues of problem and method are made explicit; we judge a lecture or a student's essay by the clarity with which the central issues are stated and the quality of the argument which flows from them.

In the world of affairs, the ability to recognize significant problems and to deal with the conceptually difficult task of bringing them into manageable and solvable form is of crucial importance - Edward Heath has, for example, noted the ability of a young French civil servant, educated in the applied tradition of the *grandes écoles*, to point him towards a viable solution for some of the fiscal difficulties in negotiating entry to the Common Market.

It may well be that one of the most fruitful means to achieving significant changes in institutional ethos, bearing directly upon a more effective balance between pure and applied values in learning and in research, is to pay greater attention to inquiry into methods of structuring learning through developing learning models.

taken part in a progression from "elite" to mass higher education without addressing this problem very seriously, with all its implications for student motivation and self-fulfilment through the conceptual, analytical and applicable development of the powers of the mind. Appropriate learning models would, it is believed, need to be explicitly problem-centred and to be conceived within a systematic framework which provides for a process of "looping-back" to redefine the problem and its system of interest as the process of understanding and learning progresses.

It is recognized that there are difficulties in the way of achieving a more problem-orientated approach to learning in higher education. However, there are some successful experiments in Europe and North America which have achieved high standards academically and professionally and which have released great motivation for learning among students. The difficulties, it is believed, are perceptual rather than fundamental and might well respond to research of a practical nature. Inevitably, arguments for learning models which are problem-centred and systematic in conception are likely to arouse great passion! Complaints of excessive scientism and instrumentalism and of a failure to grasp the essence of humane and liberal studies are to be expected. It seems possible that the complaints can be met and that commonly they derive from unduly defensive attitudes.

There should be a concern with institutional ethos

Institutional ethos is intimately associated with the research and teaching interests of the academic staff. There is no doubt that in this respect the polytechnics have benefited greatly (as Finnistad noted in the context of engineering) from the appointment of staff with direct experience of industry or the professions. The enrichment of courses of study through problem-based project work and through sandwich placements has been an important source of motivation and confidence building. Moreover, experience suggests that additional avenues of basic as well as applied research are capable of being opened up through this fruitful interaction of theory and practice.

It would be salutary for the ethos of an institution where priority is quite properly given to basic research and to closely related teaching activities for the interface between the academic system and the complex and problematic systems of the world of affairs to be expanded more actively. It would be possible to strengthen the industrial and professional membership and weight of influence of councils and governing bodies without detriment to proper autonomy in academic affairs of senates and academic boards. Likewise, it would be helpful to ensure that both formal and informal arrangements exist for institutions to sense directly the significant problems awaiting attention within their regions as well as more broadly.

In this respect, it is again possible to look to Scandinavia for some useful examples; and it is not without significance that in Scandinavian public and political support for investment in higher education appears to be substantially stronger than in most European countries.

In a plural system of higher education of this type which has developed in Britain, it is right that there should be a state and a quality of concern with institutional ethos and with the sense of purpose, the definition of role, to which it relates. Arguments for change towards an ethos which expresses a serious concern for balance in research and teaching between pure and applied studies and between the pursuit of theory and practice are not intended to be exclusive.

However, the central issues involved are currently of considerable significance in the field of higher education policy in Europe and North America; and, at a time when a Green Paper, reputedly concerned with institutional roles, is expected in this country, it might be quite sensible for academics to reflect upon these matters.

The author is director of Bristol Polytechnic.

The give and take approach

Stephen Chan looks at the philosophy behind Britain's attitude to foreign aid

The Conservative Government is anxious that private industry should play a larger role in British foreign aid programmes. Some members of the Government have even suggested that the Government should be active in the disbursement of aid only in areas where private industry cannot intervene. Privatization, and the philosophy behind it, currently the subject of fierce debate at home, is now moving abroad - into a particularly sensitive area.

Of course not every sector of the British aid effort is amenable to private industry's initiative. British aid is a very minor entry in the nation's budget. In money terms, Britain disburses less than Germany and about half as much as France. In terms of percentage of gross national product, Britain is significantly behind the Scandinavian countries, Netherlands and France.

The British aid budget includes concessional loans, support for multilateral programmes (such as the United Nations agencies) and aid linked to military projects. But a fair proportion of the British aid effort is also in what is called "tied aid". That is, the receipt of development assistance is tied to the subsequent purchase of equipment, spares, and expertise from the donor country.

Aid is thus used as a marketing device. This imposes a lack of purchasing mobility on the recipient country that often increases its own budgetary strains in maintaining a project after the British aid period is completed. But, in British terms, it provides a financial return for the "investment" in foreign aid. It is this financial return in an enterprise which the general public still considers compassionate that the Government now wishes to maintain. This does not imply a Government-sponsored scramble by British firms to establish or transfer manufacturing capacity overseas. Only under special conditions, for example foreign enterprise free-zones and full profit repatriation, is it usually worth considering the capital investment necessary to establish plant overseas, no matter what the savings in recurrent costs may be.

What private industry everywhere prays to do is to gain as much as possible from small investments. Rather than establish itself in other countries, British industry would prefer to sell licences, technology, equipment and advice. These provide a high return at little risk - particularly if their purchase is funded, wholly or partly, by British grants or concessional loans to the buyer. The country being "aided" would probably prefer the establishment of factories and offices on its soil, because of the investment this would bring. But there are now altogether too many countries with this preference who cannot offer a suitable climate for investment.

The thrust of the new "privatization" emphasis in foreign aid will be one of the Government actively seeking to provide low-risk markets for private industry; to induce, in the sweetest way possible, an openness towards British industry.

This is obviously not aid in any charitable sense. Nor really will this process provide a crucial or even strategic input to Britain's economic viability or financial planning. The process remains a peripheral, and the sums involved are paltry. But it is hardly staggering. Why do it?

In part, this is simply an extension of prevailing orthodoxy in Government thinking. The first Thatcher Government was long concerned with public expenditure cuts, on an across-the-board basis. No genuine attempt was made to establish guidelines as to whether some programmes should suffer less (or more) than others. Although foreign aid was a minor budgetary item, it was subjected to the same across-the-board strictures.

With the Government's concern for domestic privatization, it has not been difficult to extend this concern to the question of foreign aid. But this process also demonstrates a lack of philosophy about foreign aid specifically. This lack has been shared by previous governments; and, after all, tied aid

has been in existence for some time - it is simply that it now receives much greater emphasis.

In Britain, there has been an interesting demarcation between the interests and practice of official aid and the aid which flows from private agencies such as Oxfam. It has been argued that much official aid has created forms of dependence in recipient countries and is usually tied to large-scale programmes and projects which do not directly benefit the broad mass of a nation's people, and certainly not the poorest people. The non-governmental agencies, to the contrary, have for about 10 years now acted according to a philosophy of "basic needs"; of seeking deliberately to address funds and expertise to small projects of a grass-roots nature whereby hopefully the poorest can benefit.

Naturally, a question of scale is raised here. Small projects cannot generate the sort of technical data, feasibility studies and cost-benefit analyses which the disbursement of large official funds requires.

Moreover, small projects have not only a small funding requirement, they usually have a very small requirement for convertible funds. Small projects, it is argued, lose touch with their grass-roots beneficiaries, if they build around large inputs of foreign machinery or expertise. But, the question of scale apart, is the aid philosophy of the non-governmental agencies a well-conceived and beneficial one?

One immediate problem springs to mind in the customary attempt to provide aid in the form of matching funds. The recipient village, or other small community, must first demonstrate its commitment to a project by its own contribution. If the donor agency sets a figure to be reached, and the community undertakes to spread the cost evenly among its members, there will be at least a handful of people who cannot afford to contribute.

The thorny question of aid and investment returns

Should these people benefit from a project in which they did not invest? It might seem alarming that the thorny question of aid and investment returns should be asked at this level, but there are alarming numbers of projects that have been "hijacked" by comparatively well-off people able to subscribe among themselves a required local financial input and disbar the poorest people from project benefits.

There is definitely a cultural problem associated with basic needs projects, particularly when these are predicated on cooperative action by community members, leading to a community self-reliance. Project workers often fail to ask the simple question of whether this sort of communalism is culturally acceptable or not; and often it is not.

The social anthropologist Elizabeth Colson has observed a frequent confusion of means and ends. To many project workers, who have often been trained in the social sciences, the end is the development of the country, in order to work for low salaries in developing ones, the means of a project are of great significance. Thus an emphasis on community effort, the cooperative venture, the small-scale and modest project which will enrich community values as it slowly enriches community resources - an emphasis which project workers may feel is lacking in their own homes.

When aid is often misappropriated, therefore, "redirected" by the recipients away from the slowly-maturing project, to immediate individual ends such as rent, new clothes and shoes, or school fees for their children, project workers feel disappointed. Not so those misappropriators - who viewed development assistance as a means to an end, the end being a better life for them. They feel little guilt if, by guilt or dishonesty, they can reach that end more directly and more quickly.

Basic needs has a necessarily slow application. It benefits as most appreciated if gained through a process of common effort, and consoli-



Victims of the Ethiopian famine wait for food supplies

dated in the same fashion. Eventually in the project area and in other areas the community will become self-reliant, self-sustaining, and thereby secure.

It would seem almost pastoral until one remembers that the basic needs approach gained currency when it became clear that Rostow's development model of industrialization and its "trickle-down" benefits were not benefiting many poor people. There was first not enough industrialization, and second what little there was conferred most of its benefits on a narrow band of people.

But it is often forgotten that when the basic needs philosophy was proposed vigorously in the early to mid-1970s, a very large number of developing countries reacted very coolly to it. If the emphasis in development assistance was to be switched from industrialization, their countries could never establish the sort of industrial base which had always been associated with successful development and economic security. In fact, the new philosophy seemed almost designed to consign them, permanently, to a second rank of nations - with no prospect of ever catching up to the developed, industrialized nations.

As it turned out, there was no fundamental departure, in official aid, from the concept that aid could be well devoted to industrialization. And developing countries have all maintained a very high profile for industrialization in their development plans.

But the rise of the basic needs philosophy, perhaps orthodoxy, among development workers coincided with the deepening of the international recession. Although official aid funds remained available for industrial projects, there was by no means enough to satisfy the industrial aspirations of third world governments - particularly those in very young countries, in Africa, who felt the need to advance the development initiated at independence.

There were industrial projects, but nothing which could be called industrialization; and even if there had been, there was no world market for their products, due to the recession; and there were indications that beyond certain points industrialization for import substitution could be counterproductive. For the last decade the development philosophy that has gained most attention has been that of basic needs.

While many individual communities may have benefited from this philosophy, the sum contribution of basic needs to national development, as measured in gross national product, per capita income, government revenues, or even coordinated government planning, has been small. This is meaningful in that these indices are used in determining such things as international creditworthiness and the quest for that, in the current recession, cannot be avoided by developing nations.

If the application of basic needs philosophy is sometimes misjudged, and its overall contribution in indi-

marginal, is there any other approach to development assistance worth looking at? Curiously, the work of Paris University's Arghiri Emmanuel in redefining the case for industrial development, while offending many orthodoxes concerned with both basic needs and the need to avoid dependence on foreign capital and capital-intensive technology, may appeal to many third world governments - who have long been torn in their approaches to development between opportunism and an almost desperate desire for a philosophical underpinning to their development efforts.

Arghiri's work certainly seems very deep; as well as being also breathlessly polemical, its arguments are expressed so tightly that, in English translation at least, they read very obscurely. As a socialist thinker, he has come up with some startling propositions: that there is no incompatibility between socialist objectives and the borrowing of capitalist technology; that the third world would be ill-advised to develop its own high-level technology, because of research and development costs and the impossibility of catching up with existing high technology centres, so high technology should be bought, and bought from the effective sources of supply - capitalist governments and multi-national corporations; that it is better, thereby, to introduce such borrowed technology than have none at all; that hunger and poverty are the major causes of dependence, not the uses of high technology; and that capital-intensive technology is preferable to labour-intensive varieties, since its greater productive capacities, by providing a greater number of commodities, can raise the general welfare, and stimulate the economy which will in turn generate greater genuine employment.

Development is a process that is basically international; it is dependent on international relations and international economic conditions; on perceptions of how far self-interest should be regulated by an embracing mutual interest. If this is the case, the search for a philosophy of development should be anchored in the field of international affairs, rather than in more domestic considerations.

Where, meanwhile should this leave the Conservative Government and its foreign aid programmes? While it may accidentally coincide with attempts to impose a rigorous rationale upon the development process, a privatization of foreign aid or a concern with it mainly in terms of possible returns is narrow and essentially mean. It avoids the essential obligation which the undertaking of foreign aid originally implied: the furtherance of another people's welfare in terms that were appreciated by that other people.

To further another people's welfare incidentally while bent mainly on furthering one's own is a retreat even from the Victorian rationales that sent out missionaries and their medical and educational paraphernalia: to further another people's welfare according to a set standard of behaviour and equity, and an immutable code of righteousness. There at least was something to grapple with, rather than an opportunistic mercantilism.

It is not that the new emphasis in foreign aid is necessarily wrong; but it is wrong-spirited. While the search for an adequate philosophy of foreign aid continues, the British Government, with the meagre funds it devotes to this area, could do well to be at least more subtle and do better if it were more generous.

The author is lecturer in international relations at the University of Zambia.

vidual country terms.

The whole question of international recession, and the international inequalities in economic weight and institutional structures that this has highlighted, is involved. For example, industrialization is not unique to domestic uses, but inescapably linked to export drives and the need to accumulate foreign exchange. It is not the greater number of commodities produced that is at stake, but whether those commodities can be bought and at what price. If developed countries, such as Britain, simultaneously encourage third world industrialization (whether by increasing use of tied aid or less self-seeking) and retain protectionist trade barriers against the products of that industrialization, then a particularly vicious circle will have been wrought.

As it is, international development support and assistance accords, such as the Lomé convention, which have been otherwise admired, expressly omit any special deals for processed goods, that is goods that have undergone a degree of industrial treatment, that originate from third world countries. Conversely, raw materials and agricultural products, which may be consumed or industrially processed in Europe, are covered.

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BOOKS

COMPUTER SCIENCE

A genuine science?

Structure and Interpretation of
Computer Programs
by Harold Abelson and Gerald J.
Sussman, with Julie Sussman
MIT Press, £31.35
ISBN 0 262 01077 1

Despite protestations to the contrary, universities are on the whole pretty conservative institutions, especially when it comes to matters curricular. There are always good arguments against introducing a new discipline - "Is the subject suitable for education? Is it an exercise of the mind? At what level should it be introduced? Is it not sufficiently attractive to ensure voluntary attention?" These questions in fact date back to the middle of the last century, when it was proposed to introduce history at an academic subject at Oxford, but they have a fine contemporary ring to them. Nowadays, of course, the academic arguments are supplemented by the economic imperative that if money is to be found for anything new, or to expand any activity, it will have to be taken away from some existing activity. The case against a new subject becomes overwhelming.

Thus it is that in many universities the department of computer science is a small outfit, clinging out a precarious existence in the shadow of the large engineering and science departments, and prey to the current fashions in the University Grants Committee regarding "viability" and "selectivity". Indeed, the very name "computer science" is a legacy from the early struggles, when some unsung genius realized that his subject might attain an instant respectability if described as a science. But is computing science? Having myself been a scientist, and consequently knowing the difference, I can say with certainty that a great deal of

what is taught in computer science courses, although necessary and valuable, is definitely not science as it is usually understood. The description "computer science" is often in fact applied to a course which teaches "everything about computers": in practice a good deal of what is taught is computer technology - how to build software (and hardware) systems to perform certain tasks. The teaching is largely concerned with techniques, and is based on a body of experience rather than on an underlying rigorous theory. (This is not entirely true, but as Leacock observed, a half-truth is like a half-brick - it goes further.)

During the past few years, a genuine computer science, concerned with models, abstractions, algorithms and proofs, has gradually grown up, and much software development can now be based on reasonably secure theoretical foundations. However, this new view of the subject is penetrating academic courses only slowly, and it is here that this book will make its contribution - educating the teachers so that they may in turn educate their students, as the lucky students at the Massachusetts Institute of Technology, for whom this is part of the common core curriculum in electrical engineering and computer science, have been educated since Abelson and Sussman introduced their course in 1980.

Unlike David Gries's excellent book *The Science of Programming* (Springer, 1981), which expounds a mathematical approach to the subject, Abelson and Sussman take the view that the essence of the subject lies in "procedural epistemology" - the study of the structure of knowledge from an imperative point of view, providing a framework for dealing with notions of "how to" as opposed to the mathematical framework of notions of "what is". Thus, their treatment is firmly attached to programs, discussing their structure and interpretation in terms of old-fashioned, but familiar to old-fashioned teachers, like myself. This is in keeping with the philosophy of the whole MIT course, which emphasizes the engineering design aspects of the subject.

The book starts straight in with the ideas of computational process, and of building abstractions with procedures. The ideas are expressed in a derivative form of the programming language Lisp, called Scheme, introduced in the first chapter. However, the authors are not heavy-handed: the language is

introduced as part of the development of the argument, not as an end in itself, much as mathematical notation is introduced to students as needed. This first chapter brings in all the procedural ideas - predicates, conditionals, recursion and iteration, procedures as parameters and as returned values.

The second chapter considers the dual problem, building abstractions with data. Data abstraction is covered, together with representation: multiple representations and generic operators get their fair share of attention, and throughout there are plenty of examples to reinforce the argument. The authors then consider an evaluation model expressed in terms of local states, coming down firmly in favour of assignment as a necessary concept - a view that will endear them to the pragmatists who incline to dismiss assignment-free languages as academic toys. They then develop a suitable evaluation model. However, although the exposition is clear enough, I found this slightly heavy going.

Chapter four considers "metalinguistic abstraction" - defining the evaluator in terms of the language it evaluates - and the topical subject of logic programming. The final two chapters return to Earth, and remind us once more that the authors see themselves at least in part as engineers. Chapter five describes how the evaluation techniques can be implemented on a (simulated) register machine, and the final chapter discusses compiling techniques and such practical matters as storage allocation and garbage collection.

This is a long book, which takes some time to get to grips with, but it is never dull and it reinforces my belief that one of the main attractions of the academic study of computing is that it is fun. The book should be obligatory reading for anyone involved in teaching computer science at degree level: it will convince them that inside computer science there really is a true science trying to get out. Those of us who do not currently teach this kind of computer science should give serious thought to incorporating the book's approach into our courses, despite all the competing arguments for leaving the curriculum just as it is.

David Barron

David Barron is professor of computer studies at the University of Southampton.

Training objectives

The Myth of the Learning Machine:
the theory and practice of
computer-based learning
by John M. Heaford
Sigmus Wiley, £9.00
ISBN 0 905104 50 1

From this book's arresting title, I expected a critical comment on the standards of current computer-based learning (CBL) programs, exposing the myth of the computer as an effective learning machine. I was wrong: the critical comment is made but not the inference. Indeed, the author maintains that the computer can bring about a change, even a renaissance in education, and the myth is to maintain that the machine cannot fulfil this promise within the next decade. Certainly, that is a bold assertion; it requires evidence of the educational capabilities of the computer and potential can be realized. These data the author attempts to provide.

The gist of the argument is that current CBL practices, particularly in commerce and industry, lack educational imagination and are blindered by an adherence to behavioural objectives and the vestigial technology of programmed learning. This narrowing of approach is further reinforced by the experienced author languages and software packages designed for specific, though limited, purposes. The contrasting suggestion is to design materials which are more genuinely adaptive, and several research studies are used to provide supporting evidence. These point to the informational value of feedback, tailored in content and mode of presentation to the competence level of the student, and to the importance of decision-making

which encourages some learner-control. The value of investigatory and problem-solving methods is discussed, referring to the views of Seymour Papert and to the use of the educational programming language LOGO. Hence, the principal proposal is for industry and commerce to take a broader view of objectives and embrace some of the approaches being followed in schools.

The argument is interesting, although the references and research examples are narrow and treated descriptively. Hence, readers are not introduced to a critical discussion of the issues. Similarly, the industrial case-studies are clearly but uncritically described, and their contributions to the general debate are not well resolved; those from education are slight and do scant justice to some of the notable innovations being introduced into the classroom.

In considering what might be achieved by a rejuvenated CBL, Heaford turns to cognitive psychology and makes some observations on the limited capacities of human working memory and on the organization of knowledge through the development of intellectual skills. Clearly, in a small book the author has had to be selective. However, although he notes that differing knowledge structures are developed by individual learners, current views of mental processing (particularly in comprehension and in problem-solving) are largely ignored. Hence, the author underplays the value of software tools (such as, for example, educational database languages and spreadsheets) which are widely available in commerce, and the ways in which these can be used by the learner/teacher to develop skills of information handling, investigation and model building.

Having pointed to the aims and styles of desirable CBL systems, of author languages, the limitations of the current CBL materials used to produce almost all CBL materials utilized in commerce and industry

This section, together with those on instructional design and the selection and planning of computer-based training systems, are well done. They are clearly written, based on experience, and have adequate illustration and detail. The rigidity of authoring systems is criticized, particularly the use of pre-programmed templates which merely receive the trainer's course content. However, these methods are introduced to help the economics of course production, and this dilemma (of balancing the expected learning benefits of more sophisticated materials against simpler but cheaper versions) will always remain.

In moving the discussion to future developments of software tools, which will encourage and support more ambitious CBL aims, the author is less secure. Intelligent teaching/learning programs requires methods of knowledge representation, formalized as rule systems or networks, so that software tools can operate on them. These expert systems must also have adequate student models to guide teaching and explanation. Such techniques are the concern of artificial intelligence, but this topic is merely sketched in a bare three pages and no knowledge-based systems are discussed. Thus, although these chapters look to the future, their content hardly keeps up with current thinking.

Readers will not be bored by this book, though it will be of more value to those engaged in commercial and industrial training. The theme is interesting, the argument maintains its pace, and the style is direct. Overall, the author may not prove his point, but he re-affirms his faith and points us in the right direction - even if we are not taken very far down the road.

J. R. Hartley

J. R. Hartley is director of the Computer-Based Learning Unit at the University of Leeds.

BOOKS

COMPUTER SCIENCE

Pure functions

Principles of Functional Programming
by Hugh Glaser, Chris Hankin
and David Tili
Prentice-Hall £19.95 and £12.95
ISBN 0 13 709148 6 and 709163 X

In conventional, "imperative" methods of computer programming, a typical program is an intricately arranged recipe involving a potentially huge number of steps. In each step a small number of values are fetched from a store and combined by calculation. The result is stored or used to decide what to do next. The programmer intends that the net effect of obeying this recipe will be that a desired result is obtained, but the correct formulation of the program to fulfill this intention is, not surprisingly, a demanding and error-prone task.

Computer scientists have for some years been studying alternative, "declarative" methods of programming, in which one important aim is to describe a result rather than a procedure to obtain it. Some consequences of this aim are that the notions of store and sequence disappear, or at least become very much less important, and that it becomes far easier to reason about programs in much the same way as one reasons about ordinary mathematical equations.

"Functional programming" is one of these declarative methods, in which programs are built by the combination of pure functions. Each function does a rule of correspondence between given argument values and a uniquely determined result value. The values involved need not be simple items of data; in particular the values can themselves be functions.

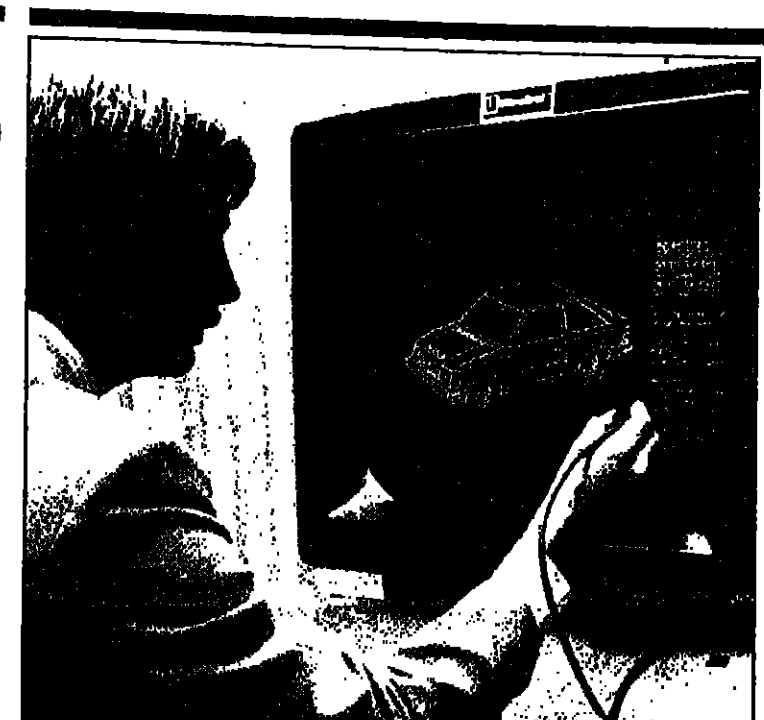
In their book, Glaser, Hankin and Tili provide a commendably thorough treatment, at undergraduate level, of the computational system involved in functional programming. They discuss in detail mathematical origins, techniques of implementation and some of the most prominent functional prog-

Parameter values

Basic Optimization Methods
by Brian D. Bunday
Edward Arnold, £7.50
ISBN 0 7131 3506 9

Given a function dependent on some set of parameters, the corresponding optimization problem consists of determining parameter values for which the function assumes an "optimal" value. Problems of this kind can occur in any activity in which numerical information is processed and are particularly common in applied science, engineering and economics. With the advent of modern computers, almost all optimization problems are now solved using numerical techniques, and the past 30 years have seen a large number of different algorithms proposed to solve various classes of optimization problems. During the past 20 years, in particular, there has been a dramatic increase in the efficiency and reliability of optimization methods, achieved by the use of more sophisticated algorithms. A large number of these algorithms are now available in subroutine libraries, the main difficulty for non-specialist users being how to decide which method is suitable for their particular problem.

In this book Dr Bunday aims to make optimization methods more accessible by selecting eight algorithms and presenting an informal description of the theory behind them, together with an implementation of each algorithm written in Basic and suitable for use on most microcomputers. This approach has the advantage that it allows readers to start solving problems on a computer immediately and therefore to gain insight into the practical problems involved. On the other hand, as it has been necessary for



Light-pen, the earliest substitute for time-consuming keyboard input of graphic information, illustrated in Annabel Jankel and Rocky Morton's *Creative Computer Graphics*.

ramming languages. The exposition is generally clear with plenty of helpful examples, particularly in the chapters containing the most formal material. Under the heading of functional languages, for example, the authors include a careful discussion of Lisp. (Among programming languages in widespread use, Lisp is the most closely in line with functional methods, but it also has a number of "imperative" of an imperative kind.) Readers are then introduced to the more recent and more powerful declarative languages FP, Hope and KRC.

My chief complaint is that the authors devote comparatively little space to the subject of designing and constructing programs. Although the stated aim of the first part is to give readers a "thorough grounding in the art of functional programming", it occupies less than 40 pages and covers numerous other matters as well. It is inevitable, therefore, that several important issues in the development of programs are dealt with sketchily or mentioned only in passing, with an undue assumption that principles can easily be inferred from examples. Other texts, however, deal extensively with programming technique, but do not deal with much of the com-

plementary material in *Principles of Functional Programming*.

The subject of declarative programming is one of increasing importance. As computer hardware becomes cheaper, the demand for productivity in software becomes more acute, and the cost of constructing programs with anything like mathematical precision becomes proportionately greater. Current developments in functional programming hold out the promise of smaller programs about which it is easier to reason. This book is therefore a timely contribution to the education of those who will create the software for tomorrow's computer systems.

Colin Runciman

Colin Runciman is lecturer in computer science at the University of York.

Works of art

Creative Computer Graphics
by Annabel Jankel and Rocky Morton
Cambridge University Press, £15.95
ISBN 0 521 26251 8

Perhaps the most striking and unexpected development in information technology during the past ten years is the use of computers to create pictures of all sorts. Many feature films now include computer graphics and computer animation as a matter of course and hardly a day goes by without some new computer-produced imagery appearing on our television screens. These pictures are often of such quality and realism that we are unaware of the part that computers played in their making. A whole new industry of designers, programmers, research workers and manufacturers has grown up to feed the demand, and some of the most powerful computers in the world are now being used in the process. *Creative Computer Graphics* attempts to illustrate and explain this phenomenon.

Annabel Jankel and Rocky Morton, two young designers who founded Cucumber Studios in London during the mid-1970s in order to make films and television commercials, have specialized in the use of computer animation. Though not computer programmers themselves, they have used the expertise of production houses on both sides of the Atlantic to carry out some impressive work. Inevitably in such a specialized subject, their lack of detailed knowledge of computing technicalities tends to show through, so that some infelicities are scattered about in the text. However, the authors (and their researchers and collaborators) must be congratulated for assembling such a wide variety of well-chosen examples supported by generally informative, though superficial, writing. On almost every page of this large-format book there is at least one picture, often in full colour. The whole adds up to an encyclopaedic collection of some of the best Amer-

ican, European and Japanese computer graphics produced during the past five years: for example, frames from video games, NASA space simulations, scientific research, advertising, computer-aided design, and feature films.

Because the authors have made every effort to give due credit to those who have created the works on show, a good deal of the text is devoted to names of designers, programmers and production houses. Though laudable in one sense, this gives the text a name-dropping appearance perhaps more suited to magazine articles than books. For my part, I would have preferred to see a single chapter devoted to detailed acknowledgments. The rest could then have concentrated on examining the motivation of those who use computers to do drawings and the part that computers play in increasing creativity. Although this theme is hinted at in the title and in the introduction, it has been largely overlooked in the main text. With their experience in working with computer graphics experts, and their own considerable design and communication skills, the authors could have illuminated this aspect in an interesting way.

Nevertheless, the book is a useful contribution to the literature. It is generally well-produced with only one or two illustrations suffering real loss of brightness in reproduction. The black and white figure purporting to demonstrate the way in which jagged lines common to television-type graphics can be eliminated, is also sadly printed as to be meaningless. I am surprised, too, that Cambridge University Press allowed the book to be published without an index.

This attractive book should be in the library of any school or department with an interest in art or computing. It would also make a more suitable gift for young programmers than an extra video game.

John Lansdown

John Lansdown is consultant to Media Computer Graphics Ltd, and a senior research fellow and tutor in the department of design research at the Royal College of Art.

ACADEMIC PRESS

For publication in early 1985

INTRODUCTION TO LOGIC PROGRAMMING

Christopher J. Hogger

The main themes covered are: the use of logic for representing and solving computational problems; PROLOG programming techniques and styles; data structures, specification, verification and synthesis; PROLOG implementation; impact upon programming methodology and education; knowledge-based applications; non-Von Neumann features of logic and fifth generation computing.

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Edited by J. Tiberghien

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F.R.A. Hoggood, D.A. Duce, J.R. Gallop and D.C. Sutcliffe
June 1983, 200pp, 0.12.549870.1
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BOOKS

COMPUTER SCIENCE

Graphic images

Computer Graphics and Applications
 by Dennis Harris
 Chapman and Hall, £20.00 and £9.95
 ISBN 0 412 25080 2 and 25090 X

The use of computer graphics is becoming increasingly widespread. There are the exotic effects on television and in films; and most personal computers can now perform some graphics. Less obvious to the general public are the ways in which computer graphics are being used in industry and the academic world, particularly as a result of the declining costs of equipment.

Computer graphics enables us to create and manipulate images and diagrams on any suitable medium, and the results can be static or dynamic. Numerous books on graphics are specifically designed for small personal computers (even for particular makes or models), and in general do not draw on the body of theory, experience and standardization available in this relatively young subject. Dennis Harris's book, which joins the small number of textbooks in this area (only two are well regarded), provides a modest introduction, with some topics selected for more detailed treatment.

The book falls into two distinct parts: theory, tools and techniques; and applications. The first part begins by describing the various types of equipment, highlighting major categories in the context of a simple application. On the whole, the author's classification is useful, except that in the section on raster scan displays he does not emphasize that this technology forms the basis of all low-cost computer graphics. Two chapters on the theory and techniques for producing computer graphics software are followed by a chapter on the draft of the new international standard for computer graphics, the Graphical Kernel System (GKS), the main concepts of which are clearly outlined with examples and figures. Here, however, a slightly misleading diagram shows four versions of the same object on the same workstation and only one on others.

The descriptions are sound and they read well. A knowledge of matrices is assumed (though typesetting limitations have presumably led to these being set out in the main text without their conventional enclosing brackets, which tends to mar the conception of a

matrix as a single entity). Non-mathematical readers, however, can skip the details of certain sections involving matrices and trigonometry, although knowing what is possible using the techniques described here is important.

Certain topics are not covered comprehensively. Beyond describing what is in GKS, there is little about how we might make use of interactive graphics techniques. There is no introduction to the fitting of curves and patches, which are widely used in computer-aided design applications. And although the single algorithm for removing from a scene those surfaces that should be invisible (hidden-surface removal) is well chosen, the author might have indicated how alternative methods differ. These deficiencies could have been offset by textual references to further reading instead of a bibliography.

The second part outlines some applications of computer graphics, including business graphics, architecture, computer-aided design of new products, commercial graphic design, and simulation of painting. Two applications, both among the most demanding, are pursued in more detail: design of simulators for the training of pilots of ships and aircrafts; and animation on film and video.

A final chapter, describing four case-studies suitable for microcomputers, illustrates some imaginative uses of computer graphics, including a bar

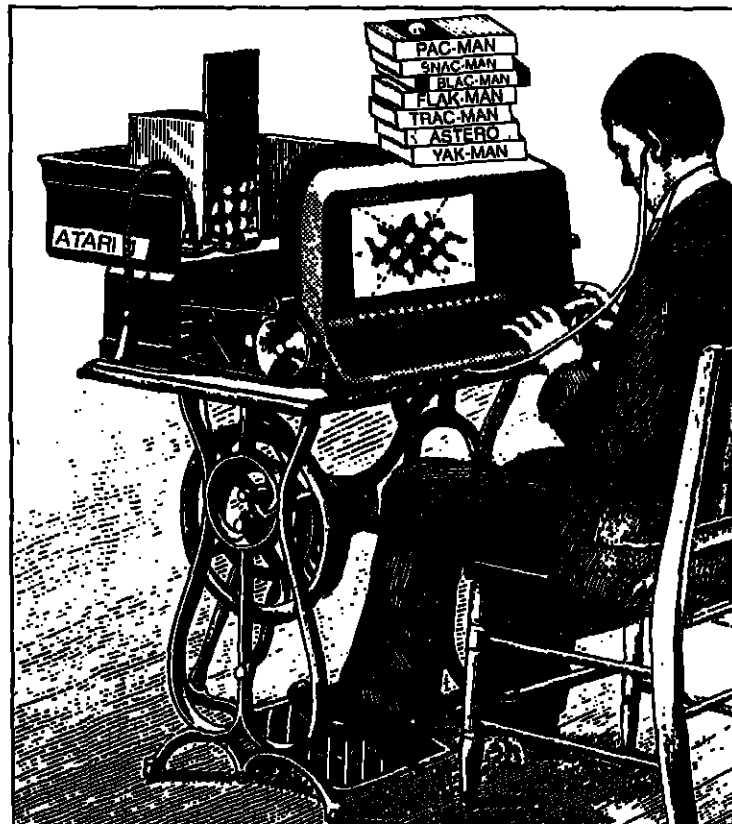
game program with elements of real life (a computer opponent that fatigues and becomes unpredictable as the evening progresses), a program to assist people with lip-reading, and another to assist in the design of a Fair Isle knitting pattern. Many readers, not just those new to computer graphics, will find this a useful basis for widening their understanding of what computer graphics can do.

Each chapter in the book ends with a number of interesting projects, some of which are quite advanced. The structure of the sections within the chapters, however, is occasionally mystifying; one section, for example, has a few lines relevant to its title before a whole page introducing the topic of the next section; advantages and disadvantages can appear in the middle of a list, and it is not clear what is being compared with which.

In a field where many of the textbooks originate in the United States, it is interesting and useful to have British examples chosen, where available. Overall, the book provides a good appreciation of topics and applications in computer graphics.

Julian Gallop

Julian Gallop is a senior scientific officer in the computer graphics section of the central computing division at the SERC Rutherford Appleton Laboratory, Chilton, Didcot.



From John Bear's *Computer Wimp: 166 things I wish I had known before I bought my first computer* (Hutchinson, £5.95).

Pascal map

Introducing Pascal
 by Boris Allan
 Granada, £6.95
 ISBN 0 246 12322 2

Despite the blatantly exaggerated claims of the publisher, that you can 'teach yourself Pascal', this book does not set out to teach Pascal. Neither does it present lots of practical examples, nor show when it is best to use Pascal instead of Basic, nor how to evaluate the different versions available for microcomputers. Indeed, there are fewer than a dozen complete programs (excluding some trivial ones that do very little or, in some cases, nothing at all), and the 'extensive, in-depth explanation' of P-code, comprising only three and a half pages, presents not one example of a P-code instruction.

What the book does present is a brief outline of some of the main features of Pascal, with some guidelines to alternative ways of tackling a particular problem. It also makes some mention of different dialects of non-standard Pascal. According to Boris Allan, the book has two major aims: to give the beginner a map of the territory and to encourage the understanding of the more complex features. It promotes a top-down approach to learning and

criticizes most Pascal texts for advocating top-down programming and yet teaching language constructs in a bottom-up fashion. Unfortunately, the author fails to recognize the difference between the top-down application of knowledge and the bottom-up manner in which that knowledge is acquired. To illustrate the top-down notion, the author suggests the planning of a journey, first using large-scale maps to plan the overall route and then using maps of increasingly greater detail. What he completely ignores is the fact that, to plan a route in this manner (or, indeed, in any manner), one must be familiar with concepts of travel and distance, know what a road is and what a town is, and know about trunk roads, roads, class 1 roads, unclassified roads, one-way streets, and much more. Consequently, the approach is quite unsuitable to anyone new to computing; it assumes far too much prior knowledge.

Unfortunately, even for more experienced readers, the benefits are limited. There is too little detail about important topics and too many passing mentions of other languages and systems. Descriptions are not always clear and are sometimes just plain wrong. For example, the author insists that the use of an undeclared identifier constitutes a syntax error. This comes early in the book, where the author introduces program syntax by considering the parsing actions of a Pascal translator. The syntax productions are presented in a cluttered variant of extended BNF, which the author claims

to have invented. In fact extended BNF is widely adopted; what he has invented is the clutter.

One statement I have not yet fully understood is the claim that 'all Standard Pascals differ'. If an implementation of Pascal differs from the standard (BS6192/ISO7185), how can it be standard? Perhaps the author means that even implementations conforming to the standard may include non-standard extensions and that these extensions may differ. Whatever he means, however, he should explain.

Some other statements cast doubt on the book's authority. Two particularly suspect opinions expressed are that the case statements ought not to be used and that variant records have little practical application. Any attempt to discourage appropriate use of the case statement is, at the very least, misguided; and, although records with variant fields may offer some threat to Pascal's run-time security (not that the author mentions this), their practicality can hardly be in doubt.

If you are already reasonably familiar with Pascal, then you might find something of interest here. And if you are unsure of some aspects, then you might learn something. If you happen to come across a copy, take a look; if not, don't go out of your way to find one.

Laurence Atkinson

Laurence Atkinson is lecturer in computer science at the University of Sheffield.

BOOKS

COMPUTER SCIENCE

Software systems

Advanced Programming: a practical course
 by D.W. Barron and J.M. Bishop
 Wiley, £16.50 and £10.50
 ISBN 0 471 90319 1 and 90521 6

There are considerable problems involved in teaching elementary programming to certain kinds of students. For those aspiring to advanced study in computing, more is needed. The real problems associated with software arise from the need to produce large software systems (composed of millions of instructions) which are truly reliable. Software engineering, the term coined as a recognition of the difficulties, is an ill-understood topic. How do teachers take students from elementary programming through to the involvement of software engineering? There is an argument that goes as follows. Introduce projects. Since we don't know how to educate in this regard, let the students learn by experience. Although it is a poor substitute for proper education, at

least it is an approach which will force students into thinking about and wrestling with the problems of designing and developing large software systems.

Given this background, it was interesting to read *Advanced Programming* by David Barron and Judy Bishop, two very experienced teachers who have jointly devoted some 13 years to refining their text as a second course in programming. The text is based on the latter language, Pascal, the authors arguing that this is a de facto standard in the teaching of programming to computer scientists. In a final chapter, however, reference is made to other languages - in particular to those features needed to support the proper structuring of large systems.

The authors emphasize practical work. There is a carefully considered and well-prepared set of ideas relating to assignments, projects and comprehension of the latter involving the modification of existing programs of which there are many, and serve to reinforce the idea that programs need to be maintainable. These exercises, and indeed the entire text, have been class-tested over a number of years.

The design of programs is seen to be composed of three interrelated components: the design of algorithms, the design of data structures and the design of input/output routines. This key observation exercises considerable influence on the structure of the book.

Chapter two is devoted to fundamental algorithms such as choosing an item at random, searching, performing frequency counts, and manipulating sets. In chapter three the notion of selecting from an imaginative

range of data structures is introduced; and this leads on to a comprehensive discussion of linear lists, stacks and queues. Chapter four is concerned with input/output, an often neglected area of programming. On input, it is often necessary to verify data and this contributes both to the robustness and to the acceptability of the product - the design of the input forms for data being a crucial factor here. On both input and output, it is important to be able to process representations of integers, reals, characters, and so on, in a variety of ways, possibly keeping track of line positions, page positions, and so on.

A second group of three chapters follows a similar pattern. Chapter five contains a discussion of sorting and searching methods based on the array. As before, the subsequent chapter is concerned with alternative data structures; algorithms associated with trees are also examined. In the third, there is a discussion of files, encompassing such structures as B-trees, file organization, file searching and sorting are also covered.

This book must be recommended reading for all those involved in the proper teaching of advanced programming. My only concern is that it does not go far enough. But then, perhaps that just illustrates the difficulties of teaching programming and the problems that face the software engineer.

A.D. McGettrick

A.D. McGettrick is professor of computer science at the University of Strathclyde.

Circuit design

Analog and Switching Circuit Design: using integrated and discrete devices
 by J. Watson
 Adam Hilger, £40.00 and £18.50
 ISBN 0 85274 758 6 and 764 0

Fundamentals of Integrated Circuit Technology
 by Andrew G. Fortino
 Reston: Prentice-Hall, £28.80
 ISBN 0 8359 2135 2

Developing Expert CAD Systems
 by Vivienne Begg
 Kogan Page, £11.95
 ISBN 0 85038 818 X

The first two years of engineering degree courses in electronics and electrical engineering contain a central core of fundamental subjects, and a substantial proportion of that core lies under the broad heading of circuit design. The extent to which circuit design is biased towards digital circuits and computer engineering, or towards analog, linear and non-linear circuits, sets the flavour of the course. The extent to which early steps towards computer-aided design (CAD) can be distinguished within the course gives an indication of the appreciation by lecturers of the importance of reflecting within the engineering course, present practice in industry where low-cost CAD is now having a major impact.

Analog and Switching Circuit Design, a massive book of some 600 pages, is without doubt an invaluable reference work to stand alongside many similar older texts originating mainly in the United States. It is well written, not overburdened by mathematics, and admirably comprehensive. Even the blocking oscillator, a near extinct species, is there. Sufficient depth of treatment, however, is maintained by leaving out digital logic circuits at the end of the spectrum, and high-frequency circuits at the other.

The important question is not whether this book is a good one, but whether students should study circuit design in such depth. After all, page after page of the formulae, analysis, approximation, parameters, connections, and so on, relevant to transistor amplifiers are straight from the 1960s; and even then circuit designers seldom used such detailed analysis. Today's students have more important things to do; and although no one would suggest that we lose sight of fundamental engineering courses now require a totally different approach.

The first steps towards CAD involve using the computer to take out the burden of calculation so that the engineering objectives can be revealed. We should not be warned by the author in his only reference to

CAD, that CAD is dangerous, that it is not really CAD at all, and most likely futile. At first-year and second-year undergraduate level, computer-oriented design is important in framing attitudes both to engineering and to the computer as a tool for engineers to use. Books written in the mid-1980s must take recent advances and current practice into account or they add nothing to either the subject or its teaching.

Fundamentals of Integrated Circuit Technology is in many ways similar to Watson's book, but over-mathematical treatment of integrated circuit technology, aimed at second-year and third-year undergraduates. The book also clearly demonstrates the change of approach needed to accommodate the fact that of all areas of design, integrated circuit (IC) design is one of those which can most fully be automated by computer. The author has therefore not produced a book on IC design but has instead produced a book that instructs students working within the technology about how they can understand the basis of design through the devices and the problems of analysis, measurement and testing, and appreciate and use CAD techniques. The result is a well-balanced book which orients semiconductor studies to the IC.

Although the book does not contain computer programs or even offer any to instructors, there are computer exercises throughout which yield useful programs from the text. Also, the final chapter is devoted to an appreciation of CAD applied to the analysis and design of ICs, thus preparing serious students of IC design for the author's specialist book on CAD. The book shows that CAD techniques can be incorporated into the undergraduate course without obscuring the fundamental engineering content, and this has been achieved in an area of design where the temptation is to let CAD take a dominant role.

Developing Expert CAD Systems, the product of research into CAD, should take us not only towards CAD but beyond to expert or intelligent CAD systems. At the very least we should find enough to guide us towards CAD for engineering courses. Such books are all too rare, yet needed if expensive CAD facilities are to be installed with any degree of confidence that the facilities provided are actually useful. Unfortunately, engineers will glean nothing from this book, as it is essentially a CAD guide for managers with no idea of engineering either before or after reading it.

So much for first impressions. What does the author have to say about analog circuit design, one of the first subjects to which computer-aided techniques were applied? Here, however, just six sentences inform us that 'analog design is a declining field, and not much use is made of circuit analysis programs for this application'. Never mind, logic design only

Digital logic

Digital Logic Techniques: principles and practice
 by T.J. Stonham
 Van Nostrand Reinhold,
 £11.50 and £5.75
 ISBN 0 442 30593 1 and 30595 8

Computers and Microprocessors: components and systems
 by A.C. Downton
 Van Nostrand Reinhold,
 £11.50 and £5.75
 ISBN 0 442 30571 0 and 30572 9

Aimed specifically at first-year and second-year undergraduates, Van Nostrand Reinhold's Tutorial Guides in Electronic Engineering have been designed very much for students working on their own. The main text is confined to the inner three-quarters page width, with a wide margin running down the remaining outer edge of each page. Within this margin are printed at appropriate points short little notes and mnemonics, such as 'Remember', 'Hint', 'Refer back to', or possibly some longer explanatory comment. This has the great merit of allowing the text to flow in a smooth manner, so that the reader who is not in difficulties is uninterrupted while at the same time students who require help are provided with additional comments or guidance. The style is reminiscent of Open University course units. Although there are no diagrams in the marginal areas, there is extensive use of figures in the text. This makes the series particularly attractive, and it should provide a very powerful adjunct to formal classroom lectures.

Stonham and Downton's contributions to the series to a large extent complement each other. Stonham begins by comparing analog and discrete representation of signals, with a strong practical emphasis that both may be used in engineering applications. The bulk of the book, however, is concerned with digital representations in the form of conventional binary signals - binary coding, binary-coded-decimal and error detection and correction coding all being introduced.

Chapter two provides good, though conventional, coverage of the fundamental principles of combinational logic - the illustrations, marginal notes and worked examples being particularly helpful here. Similarly, the following chapter on logic principles, together with two further chapters on

the application of those principles to the design of digital networks, provide a sound basis for student study.

Two final chapters, on the digital system and on practical digital circuits - ranging over a number of practical details (such as multiplexers, random-access memories, programmable logic, commercial logic families, analog-to-digital and digital-to-analog conversion) - illustrate well the strength and weakness of the book: although the basic coverage is excellent, depth of coverage is limited.

Downton's aim is to produce an integrated approach to computers and microprocessors, with equal emphasis on components, systems, applications and design. Some prior knowledge of basic digital electronics is required, although marginal notes and references again provide useful guidance to further information. As the author so rightly mentions, the teaching of 'computers' is peculiarly difficult: being relatively complex entities, a great deal of peripheral knowledge must also be acquired. An entertaining introduction, covering the history and basic concepts of computers, should lead students painlessly into more technical matters.

Divided into eight chapters the rest of the book covers memory structures and architecture, data representation in computers, data processing, input and output interfaces, instruction size and addressing modes, programming computers and microprocessors, computer systems, and system software. A final chapter presenting a microprocessor design example for a central heating system, provides insight into both hardware and software aspects.

All chapters maintain a high standard of clarity - particularly those dealing with software aspects, which lead students through the various levels of programming from machine code level to high-level languages. Although like Stonham's text, the main disadvantage is its limited length, within this constraint it is very successful.

S. L. Hurst

S. L. Hurst is a visiting fellow in electrical engineering at the University of Bath.

A fourth edition of *A Glossary of Computing Terms: an introduction* has been published on behalf of the British Computer Society, by Cambridge University Press, at £1.75.

The proceedings of a symposium on *Computer Education: Chemistry*, presented in 1982 at the American Chemical Society, have been edited by Peter Lykos and published by Wiley at £37.60.

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During 1985, the Times Higher Education Supplement plans to publish Three special features on INFORMATION TECHNOLOGY

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BOOKS

COMPUTER SCIENCE

Character strings

Text Processing
by A. Collin Day
Cambridge University Press,
£14.00 and £5.95
ISBN 0 521 24432 3 and 28683 2

The past few years have seen a marked shift in the use of computers from number crunching to text processing, mainly because of the growing use of word processors. Indeed, it is likely that more data are now input to computers in text form than in numerical form. This book is not, however, for those interested in word processing, information retrieval or any application of text processing, as it is concerned solely with the writing of computer programs to process text. It describes primarily the special characteristics of a language needed for text processing - such as the ability to handle variable-length character strings - and to perform operations on them - such as pattern matching. It shows that current general-purpose programming languages only have these facilities in a rudimentary form, illustrating this with examples from two languages, Fortran 77 and Pascal. It also describes one other language, Snowball, designed specifically for text processing.

The general-purpose language Fortran 77 is almost exclusively used by engineers (or scientists) for numerical calculations: it is not likely to be used for text processing, except very occasionally by engineers for headings to tables, graphs, and so on. However, its facilities for text handling are better than those in Pascal, which is used for teaching in most computer science courses. Readers who are not already acquainted with Pascal, however, may not find the examples readily accessible, and it would be far from easy for them to write a Fortran or Pascal program to analyse text solely from the material presented there. Readers must therefore have some previous knowledge of some computer language.

The first four of twelve chapters are concerned with methods of storing and manipulating characters, with exam-



Multi-fingered robot hand, from *The AI Business: commercial uses of artificial intelligence*, edited by P. H. Winston and K. A. Prendergast (MIT Press, £14.25)

ples in Fortran and Pascal. The next three chapters are concerned with variable-length character strings, usually words or lists of words, again with examples in Fortran and Pascal and with a single reference to a third language, PL/I. Chapters eight to ten give a useful introduction to Snowball, a language with a strange syntax. However, it is not difficult to learn, and it can be used to produce much shorter and simpler programs than the other two general-purpose languages. This is illustrated using two examples: in chapter eleven by the computation of the word frequency count in the text; and in chapter twelve by the production of a concordance, that is, a list of the words of the texts sorted in alphabetical order and printed along with the lines in the text in which they occur. There is a short bibliography and an adequate index.

Exercises are provided at the end of each chapter, with solutions at the back, so the book could be used for teaching a course on text processing. As it is unlikely that such a course would be used by scientists or engineers, the sections on Fortran are the least valuable as student material. However, the book might suit students already familiar with numerical handling in Pascal: they could extend their knowledge to character string handling and then study a well-written introduction to Snowball.

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Edward Arnold
41 Bedford Square, London WC1B 3DQ

Prolog mysteries

Implementations of Prolog
edited by J. A. Campbell
Ellis Horwood: Wiley,
£29.50 and £14.95
ISBN 0 85312 675 5 and 618 6

Inspired by the ideas of Robert Kowalski (now at Imperial College, London), Alain Colmerauer (of the University of Marseilles) designed the computer programming language Prolog in about 1970. Its fundamental basis (hence its name) is the notion of PROgramming in LOGic, where computation can be viewed as controlled logical inferences.

As Prolog systems contain many built-in computational mechanisms useful to research and development in artificial intelligence (AI) and expert systems, it has become a popular choice for solving problems that involve the symbolic representation of objects and the relationships between those objects. Applications of symbolic computing to which Prolog has so far been successfully applied include: equation solving; natural language understanding; electrocardiograph analysis; architectural design; intelligent process planning; drug design; and system design.

The Prolog programmer is required to specify rules that are in a form similar to that of first-order predicate calculus. To search for a solution, users of a Prolog program must ask questions of the Prolog system's user interface, which is conversational via a keyboard. An attempt is then made to satisfy those questions by trying to match the initial question with facts or rules accessible via the Prolog system. Those rules contain information which may match the original question, but they may contain additional information that requires further questions to be asked and answered before one or more solutions can be achieved.

This collection of papers, designed to instruct readers about implementation - which refers principally to the

algorithm that interprets Prolog language statements or, in an alternative method of implementation called compilation, to the algorithm that interprets a set of primitive computer instructions that are a transformed representation of the original language statements. Although this latter method of implementation is the more important and contentious, detailed knowledge of it lies in the domain of only a dozen or so researchers - few of whom are represented in this book. Its editor, Professor Campbell, admits that because of the frantic interest in Prolog many implementation experts have not had the time to put their knowledge and expertise to paper - so the book must inevitably fall short of its aim of clarifying the mysteries of Prolog implementation.

The main problem with the book, however, is that if readers are not familiar with all the notations or programming languages used, it will be difficult for them to piece together the details and establish general concepts. For instance, in one paper the implementation information is presented in four pages of Lisp, the American AI language with which Prolog competes. And its author attempts to convey implementation details with the "world's shortest Prolog interpreter," the hopelessness of which is only surpassed by a Prolog implementation written in Prolog and consisting of four lines.

The book contains a significant number of papers that are not relevant to its title, particularly those referring specifically to logic programming. Although Prolog embodies a subset of ideas from logic programming, it is not synonymous with it - a misconception that many researchers have been trying to dispel. Also, many fundamental tasks associated with implementation and development strategies for the language, are not covered; whereas topics having little impact on implementation - such as the user interface - are included.

Paul Wilk

Paul Wilk is a research fellow in the programming systems group of the department of artificial intelligence at the University of Edinburgh.

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T. M. R. Ellis

T. M. R. Ellis is Director of the Computing Teaching Centre, University of Oxford.

BOOKS

COMPUTER SCIENCE

Alvey boost

Introducing Artificial Intelligence
by G. L. Simons
National Computing Centre
Publications: Wiley, £10.80
ISBN 0 85012 457 3
Artificial Intelligence: human effects
edited by Masoud Yazdani and
Ajay Narayanan
Ellis Horwood: Wiley,
£22.50 and £12.50
ISBN 0 85312 577 5 and 817 0

Artificial Intelligence (AI), a multi-disciplinary field spanning inter alia computer science, psychology, philosophy, mathematics and electronic engineering, has come into the limelight during the past few years, principally as a result of the Japanese Fifth Generation Programme and its associated international responses. There is now growing realization of the commercial potential of so-called "expert systems" - programming technology designed to mimic the decision-making skills of professional groups, such as lawyers or accountants.

In Britain the AI research community was all but wiped out in the 1970s, following the publication in 1973 of the ill-considered but highly damaging Lighthill report to the Science Research Council. Those who survived the resulting purges lived to see their work rehabilitated by the publication in 1982 of the Alvey Report on Advanced Information Technology to the Department of Industry (under the sanitized name of "intelligent knowledge-based systems") and emerge as the height of academic fashion, the subject of immense publicity and development activity by many of the country's leading companies.

In recent months, critics of AI have re-emerged to challenge (often in very vigorous terms) the idea that computers can literally be intelligent or think or understand. It might surprise the critics to realize that most of those who proclaim the intelligence of computers are, in fact, outside or peripheral to the field rather than AI researchers themselves. Whatever the outcome of the philosophical debate, the interests of AI researchers are more pragmatic and of increasing practical use. Since the critics choose to make the "thinking computer" the battleground, it must be said that many of their arguments are spurious.

Much effort has been devoted to the attempt to prove that computers cannot possess properties that are themselves notoriously ill-defined and elusive (or defined in numerous different ways, depending on context). For mysterious reasons, empirical evidence does not seem to be admissible. Suppose that a computer program could be written (and this is not even remotely within sight at the present time) which could input the complete body of European literature and then answer searching questions on, say, Shakespeare to the complete satisfaction of a panel of professors of English literature. Even then, many would argue that the computer did not understand Shakespeare, it was merely simulating doing so. It is fortunate that such suspicions are not extended to the average literature student.

If machines can simulate the possession of intelligence, does it matter whether they are really intelligent or not? This argument is clearly one that could be pursued at great length, and it would impinge little on the everyday work of AI researchers were it not for the extreme sensitivity of the topic in funding circles. With the Lighthill report still a painful memory for many, it is reasonable that Geoff Simons's book should provide the critics with further ammunition.

Simons is not himself an AI researcher; he is chief editor of National Computing Centre (NCC) Publications and has published books on a wide range of computing topics. Most of the book is a clearly written and well-researched account of the content and activities of AI researchers, with chapters on problem solving, inference, and inference, visual perception, and language understand-

standing, expert systems, and other AI products. Simons is particularly good at describing a large number of projects, hardware and software, worldwide in a brief but clear fashion. Appendices include a select bibliography and a helpful list of some 130 AI systems from ABEL to XSEL.

This book could be recommended to the interested layman, manager or computer professional (as opposed to the prospective research student), were it not that most of them will be antagonized by the author's surprisingly strong views on computer intelligence. Simons deploys the (rather suspect) arguments of Alan Turing's classic 1950 paper "Computing machinery and intelligence" to refute various kinds of objection to the idea that machines could think. He then proceeds to assume that the opposite conclusion has been established (rather than making the correct conclusion that the matter remains open). He comments: "It seems clear that working among us... are already intelligent machines... are already working among us." In the final chapter this is extended to "Increased understanding will combine to extend the spectrum of AI to such phenomena as intuition, creativity and emotion... There is in principle no human faculty that could not be built into artificial systems" (Simons's italics). Such strongly-held and contentious views fit uneasily into the largely factual approach of most of the book and may give a very misleading view of AI to lay readers.

By contrast, *Artificial Intelligence: human effects* written for insiders not lay readers, is described as a "paper symposium", presented at a debate on the social, philosophical and educational aspects of AI. No attempt is made to draw conclusions from the 16 papers included or to cover all shades of opinion.

Several of the papers are by leading figures in AI, but suspicion that some papers were chosen solely because of their availability is aroused by the fact that two-thirds of the authors have been closely connected with the universities of Essex or Sussex. Of the remaining papers, three were originally written in 1979.

Overall, although the collection is interesting, the quality is uneven. Moreover, even though topics such as whether computers have freedom of choice (discussed in the chapter on "Can computers have legal rights?") are no doubt of great interest to philosophers, it would be a great pity if any lay readers were misled into imagining that AI researchers spend their days in philosophical musings rather than seeking practical solutions of problems that are often of great commercial importance.

Max Bramer

Max Bramer is head of computing science at Thames Polytechnic.

A paperback edition of Fred I. Dretske's *Knowledge and the Flow of Information* has been published by Blackwell at £6.95. The hardback was reviewed in *The Times* on December 11, 1981.

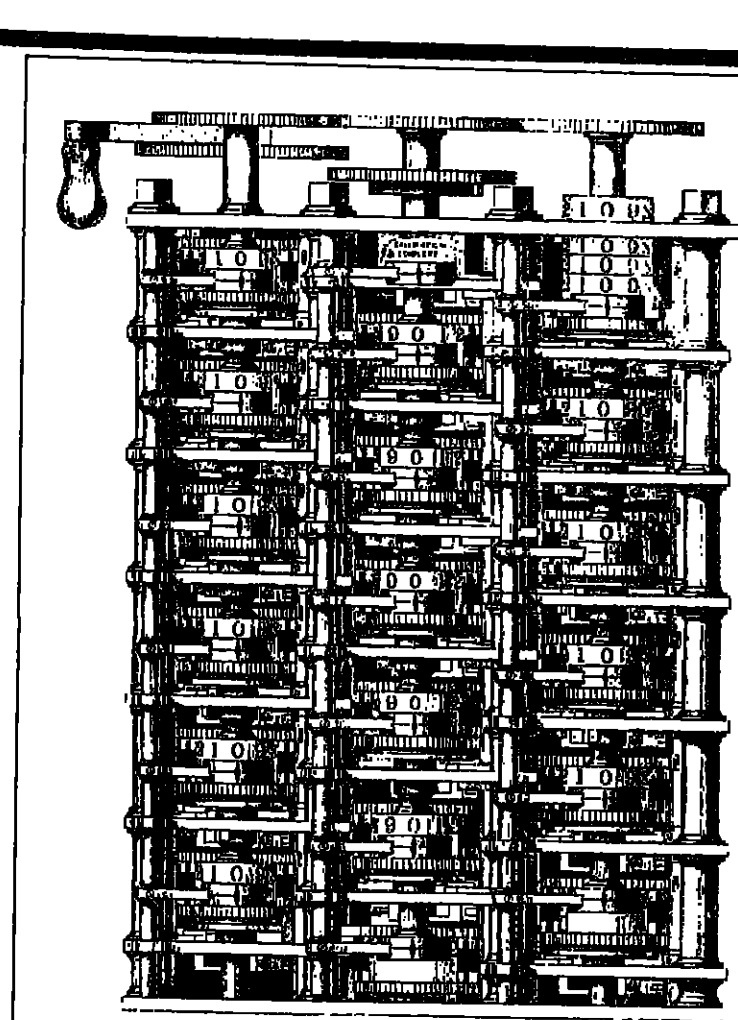
Building design

Microcomputer Applications in Structural Engineering

by W. H. Moseley and W. J. Spencer
Macmillan, £16.00 and £7.95
ISBN 0 333 34089 2 and 34090 6

Many structural engineers spend a significant amount of time on mathematical calculations, for example, in analysing the stresses on bridges or designing buildings. The engineering skill is concerned less with the details of these calculations (even though these may be lengthy) than with the decisions to be taken on the basis of the results obtained. Since microcomputers are essentially interactive and ideally suited to calculations punctuated at frequent intervals by the need for subjective decisions - typical of the design work in structural engineering - their use in this area is increasing rapidly.

Compared with the established batch-processing of larger computers, mainly for unusual or complex problems, the use of microcomputers is therefore not only potentially much more extensive but also quite different. Consequently, those books dealing with the application of traditional computing in the industry are not directly relevant to microcomputers.



Woodcut of Charles Babbage's difference engine number one. From *Babbage's Calculating Engines*, a collection of papers by H. P. Babbage with a new introduction by A. G. Bromley (MIT Press, £47.05.)

Ada's story

Understanding Ada
by Kenneth C. Shumate
Harper & Row, £12.95
ISBN 0 06 046133 0
Introduction to Ada
by David Price
Prentice-Hall, £27.55 and £19.40
ISBN 0 13 477 653 4 and 477 646 1

The Ada programming language, designed for the United States Department of Defense in 1979, was standardized by the American National Standards Institute (ANSI) in 1983, and some progress is currently being made towards obtaining an International Standards Organisation standard for the language. The introduction of any new language is a slow process: although Pascal was designed in 1970, books on Pascal did not sell widely until 1978; and many establishments have moved to Fortran 77 only this

This text provides a useful bridge between microcomputer technology and conventional structural analysis and design - an area in which little has yet been published.

In order to make best use of microcomputers, structural engineers should have some background in how they work and in programming. This book provides a useful introduction to both - sufficient for the principles to be grasped by someone new to the topic. A similar introduction is given to both disk files and graphics (for those interested in studying these in greater detail, further reading is recommended). Although the authors have attempted to present a general treatment of these topics, it has been necessary to illustrate them with respect to specific microcomputers - Pet and Apple systems - but unfortunately not the ones which other students or practising engineers are most likely to use.

More than half of the book is devoted to specific examples of structural engineering application programs, the range of examples having been well selected. The programs listed include design routines in steel and reinforced concrete, as well as frame analysis and more general techniques such as the solution of simultaneous equations and the calculation of the properties of members with arbitrary cross-section. In all cases a résumé of the theory is given with reference to more detailed treatments in the bibliography. A flow diagram and a description of stages within the

program provides a useful introduction to the program listings themselves. The principal variables used in the program are also given and each concludes with a typical example program.

The complexity of the programs has been well graded, starting with short, simple routines and building up to more complex and extensive programs. In general, their extent has been sensibly restricted, avoiding the potential difficulties of readers having to interpret numerous pages of listings. However, the authors do suggest ways in which individual programs could be combined to produce more powerful packages.

In this way, and by choosing commonplace examples, the authors have gone a considerable way to avoiding the pitfalls of published program listings. However, it is disappointing that the emphasis is on the technical content of the programs, with no description given of how to make best use of interactive computing. Indeed, the programs listed could run in a batch-processing mode were it not for the use which is made of data prompts and interactive data input. Even relatively fundamental points such as error trapping and truncating displayed results to a sensible degree of implied accuracy, are given little or no attention.

Only limited use is made of sub-routines. Had these been treated in more depth, it might have been possible to include routines dealing with data editing and interactive control, which form so essential parts of microcomputer programs for engineering design, without unduly increasing the length of the program listings.

The development of the Ada language has had a large British involvement. Unfortunately, it has not been possible to translate all this effort into marketable Ada products. The development of a compiler at the University of York has been slow, so that validation is still a little way off. Commercial efforts in Britain are now focused on an American, a Danish and a West German compiler. Plans by the Ada Group Ltd to produce both a high-quality compiler and an APSE have had to be abandoned.

The largest single cost in the introduction of Ada is not making compilers or even APSEs but that of training programmers. Books are clearly an important contribution to training and quite cheap compared with the thousands of pounds for a compiler course. To cover the language comprehensively beginning with fundamentals would require a large book; both these books are of modest length. To cover the novel features and provide a "one-pass" treatment is particularly challenging. A litmus test for a book on Ada is the treatment given to exceptions, the facility of the language to handle error conditions. Exceptions can be used to make Ada programs more robust but the disciplined use of the feature is vital. Neither of these books perform well in this test. Although David Price's many examples seem to have been checked on one of the validated compilers, errors have crept in, mainly in the illustrations and the use of July 1982 Ada rather than the ANSI standard. To avoid some of the problems of the size of the language, several aspects have been omitted. The omission of the Ada tasking concepts based on Professor Tony Hoare's work is particularly unfortunate.

Ken Shumate's book seems to be a written version of lectures intended to provide an "informal" introduction to the language. However, although the book is easy to read and is very strong on the philosophy, rationale and background to the language, the coverage of the language itself is superficial. Pages are wasted giving the output from some simple programs, and there is no mention of the higher levels of abstraction obtainable with access types. One advantage of giving the background is that the reasons for the Ada design then become apparent. Ada has been criticized for being too big or too verbose by many who have not appreciated the design goals. Ada is certainly more complex than Pascal but this is essential to meet the requirements of real-time defence (and civil) systems.

In 1985 there will be a substantial increase in the use and availability of Ada: hence the need for good books. Although I would not recommend either of these books, they are competently written and are probably better than the average Pascal textbook.

Brian Wichmann

Brian Wichmann was a member of the Ada language design team.

engineering design, without unduly increasing the length of the program listings.

The omission of the essential ingredients of an interactive computer program is a weakness; programs listed would require considerable modification before they could be used efficiently in the design office. Nevertheless, the wide range of examples provides useful source material, and the book should be of interest to students in this field. Practising engineers may also find it of value in providing the basis for programs to be written for their own applications. The power of microcomputers to perform extensive calculations in realistic structural engineering applications, and consequently their value to the profession, are amply demonstrated.

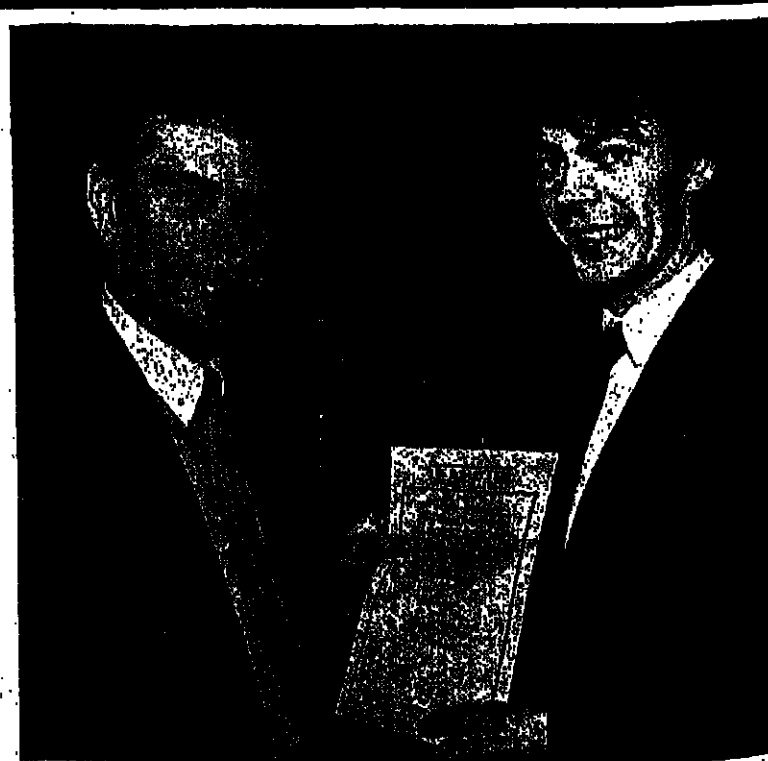
R. J. Plank

R. J. Plank is a lecturer in the department of civil and structural engineering at the University of Sheffield.

A second edition of J. G. P. Barnes's *Programming in Ada* has been published by Addison-Wesley at £12.95. The thorough revision of the text was prompted by the publication of the American National Standards Institute standard for Ada, approved February 17th, 1983. The new ANSI standard reference manual has been published as *The Programming Language Ada Reference Manual* by Springer-Verlag.

CLASSIFIED ADVERTISEMENTS

date for applications, 31 December 1984. (54141) H



Universities continued

THE UNIVERSITY OF ASTON
IN BIRMINGHAM

Nowhere is the pioneering, innovative approach more apparent than at Aston University — one of the country's leading technological Universities. We are building upon an already considerable record of sustained achievement and developing new initiatives in teaching, scholarship and research. Such developments demand the highest standards and offer demanding challenges and major opportunities for outstanding individuals. If you can meet these challenges — we would like to hear from you!

"NEW BLOOD" APPOINTMENTS

Lectureship: Department of Vision Sciences

A vision scientist, preferably with an interest in eye movement, is sought to join a multi-disciplinary team of researchers and clinicians in the Department of Clinical Neurophysiology Unit. The appointee will be involved on theoretical, physiological and ophthalmological studies, and will be expected to contribute to the undergraduate honours degree course in ophthalmic optics, which is currently attended by one-third of the UK's undergraduates in this field. We seek a young person, with an exceptional record of research and publication in vision sciences generally and the ability to work in a creative group of colleagues on research, teaching and the development of new techniques for clinical investigation. (REF. 850156)

Lectureship: Department of Mechanical & Production Engineering

The adoption by industry of new technology is rapidly changing the job of the Mechanical Engineer, and skills in the application of microprocessors are in great demand. At Aston, a small team in the Mechanical and Production Engineering Department has been developing a strong base in the microprocessor control of electrohydraulic and electrically powered actuating mechanisms, with data collected from sensors ranging from position transducers through ultrasonic detectors to video camera displays. The applications have included work on grinding equipment, the control of free ranging vehicles, the control of attachments to agricultural machinery, and the improved control of mining machinery. The lecturer appointed to the "new blood" post will extend the work to the control of high-speed machinery or will develop microprocessor based identification techniques for control systems. The work requires ability in the application of electronics, the design of mechanisms and the writing of computer software. The successful applicant, who would have a good degree in a suitable engineering, science or mathematical discipline, would be expected to have sound experience of one, and preferably more, of these fields, together with a strong interest in developing skills in the others. (REF. 851186)

Lectureships: Department of Pharmaceutical Sciences

Applications are sought for two posts from candidates with an excellent primary qualification in pharmaceutical or physico-chemical sciences and who have recently completed, or soon will complete, a PhD degree.

1. "New Blood" Lectureship in Drug Delivery System Design (REF. 852125)

The Department has annual recurrent funding from external sources in excess of £200K and considerable resources will be mobilised to support these posts.

If appointed, you will be expected to collaborate with members of the Drug Development Research Group and to initiate original projects within the area of advanced drug delivery system design, physical pharmaceuticals or formulation development. Your application will be especially welcome if you have the motivation to make a research impact in the pharmaceutical development of the novel moieties and therapeutic strategies engendered by recent advances in molecular biology and genetic technology.

MANAGEMENT CENTRE

As one of the UK's leading business schools, the Management Centre operates at postgraduate, post-experience and undergraduate levels, pursues a vigorous research programme and has a specially funded ESRC Doctoral Programme.

SOCIAL & TECHNOLOGY POLICY DIVISION

Lectureship: Management of Innovation

The prime responsibility of this post is the development of new projects and a contribution to existing programmes in both teaching and research, with special emphasis on the sociological aspects of innovation. The successful candidate will have a good first degree and a doctorate, including an academic qualification in Sociology, Social Anthropology or a related Social Science, and experience in industry, commerce or public administration. (REF. 854158)

Lectureship: Management of Technology Transfer

The Technology Policy Unit is an integral part of the Division, whose current and prospective interests include technology transfer, technological education and professionalisation, historical and comparative aspects of technological change.

This lectureship, which involves teaching and research focused on aspects of the development of technology, requires a first class degree and a doctorate, including an academic qualification in Sociology or a related discipline. (REF. 853188)

FINANCE & ACCOUNTING SUBJECT GROUP

This Subject Group, which is part of the Corporate Management Division headed by Professor E.W. Davis, provides a significant input into the postgraduate programme on the sociological aspects of innovation. Specialist options are taught in Business Finance, Taxation and International Finance, as well as mainstream courses in Financial and Management Accounting. Contract research programmes cover the organisation of management accounting and currency risk management in UK companies.

Lectureship: Financial Management

With research and teaching experience in the general field of financial management, the successful candidate will be expected to teach finance to both undergraduate and postgraduate students and will be actively encouraged to undertake research. (REF. 854158)

Senior Teaching Fellow: Accounting

A qualified graduate accountant with either teaching and research backgrounds or with relevant practical experience, is sought to play an active role in teaching and to contribute towards course development in the Management Centre. This appointment will be made for a period of three years, with the possibility of renewal for a further period not exceeding three years. Salary will be within the range £24,136 to £27,705 per annum. (Other related Staff Range 11). (REF. 857125)

Appointments to Lectureships will be for a period of three years with the possibility of renewal or transfer to a continuing appointment. Salaries will be within, and may be up to the maximum, of the range £27,705 to £31,816 per annum.

If you have the qualities and expertise for these posts, write or telephone for further information and an application form (quoting appropriate job reference number) to: Personnel Officer (Academic Staff), University of Aston in Birmingham, Gosta Green, Birmingham B4 7ET. Tel: 021-359 3911 (Ext. 489).

Closing date for the receipt of applications: 18th January, 1985.

University of Cambridge

Centre of South Asian Studies

GRADUATE STAFF

Applications are invited for a member of the

of the Centre to take up

as soon as possible thereafter.

The pensionable scale of

will be £4,900 per annum

with a further annual

of £200.

Further details may be

obtained from the Director

of the Centre, 10, West

Cambridge CB3 9AP.

Applications should be sent

to the Director of the

Centre, 10, West

Cambridge CB3 9AP.

The University of Sheffield

UNIVERSITY COUNSELLOR

Applications are invited

from men and women gradu-

ates with a good first class

degree in Psychology and

experience in counselling

work. The successful candi-

date will be expected to

contribute to the develop-

ment of the University's

counselling service. The

post is full time and the

salary is £11,000 per

annum. Applications should

be sent to the Director of

Staff, University of Sheffield,

Sheffield S10 2TN.

University of Manchester

LECTURER IN COMPUTER SCIENCE

Applications are invited

for a Lecturer in Computer

Science. The successful candi-

date will be expected to

contribute to the develop-

ment of the University's

computer science service.

The post is full time and

the salary is £11,000 per

annum. Applications should

be sent to the Director of

Staff, University of Man-

chester, Manchester M13

9PL.

THE OPEN UNIVERSITY

Summer School
Tutorial Staff

Appointments for one or two weeks are available at the Open University's summer schools held at universities throughout Great Britain between 6th July and 7th September 1985.

Tutor Posts in the Faculty of Arts

Tutors qualified in:

Art History, History, Music, Literature and Philosophy.

Tutor Posts in the Faculty of Social Sciences

D102 - Making Sense of Society.

Tutors experienced in teaching introductory level Social Science and in interdisciplinary teaching, qualified in one or more of: Economics, Human Geography, Politics, Psychology, Sociology, to teach in one of three interdisciplinary modules - Crisis and Conflict; The Fight for Shelter; Mass Media and Society; Man and Women and Society.

D5282 - Introduction to Psychology

Tutors with experience of Experimental Methodology in different areas of Psychology.

D303 - Cognitive Psychology

Tutors qualified in Experimental Psychology. Computer experience desirable.

Tutor Posts in the Faculty of Mathematics

Tutors for the following courses: Mathematics: A Foundation Course (M101), Introduction to Pure Mathematics (M203), An Introduction to Calculus (M283), Mathematical Models and Methods (MST204).

Tutor Posts in the Faculty of Science

Tutors qualified in: Biology, Chemistry (Organic, Inorganic, Physical and Photochemistry), Earth Sciences and Physics.

Tutor Posts in the Faculty of Technology

Tutors qualified in Elementary Mathematics and Modelling (for technologists) (TM282), Materials Science (T252), Systems (design, planning and management of social or technical systems), and Engineering Mechanics (Solids) (T232).

T101 - Living with Technology

Tutors having teaching experience and qualifications and/or interests in the areas of Energy Policy and Resources, Microprocessors, Water Quality (Biology or Chemistry), Materials Science/Metallurgy, Mechanical Engineering.

T281 - Basic Physical Science for Technology

Tutors qualified in general properties of matter, electricity, optics, heat and chemistry.

T283 - Introductory Electronics, and T291 - Instrumentation

Tutors qualified in Electronics and/or Instrumentation: previous teaching experience an advantage.

T40292 - Art and Environment

Tutors to facilitate creative projects in a range of practical project-based multi-media arts.

Tutor Posts for the U-Area

U203 - Popular Culture

Tutors with teaching experience and interest in the following areas: Cultural Studies, Semiology, Film and Television Study, Sociology and Social History.

U204 - Third World Studies

Tutors with experience of teaching Third World Studies in Higher Education.

U221 - The Changing Experience of Women

Tutors with experience of teaching Women's Studies within Higher, Further or Adult Education.

Demonstrator Posts

Graduates in Science to work in areas of Biology, Chemistry, Physics, Earth Sciences. Graduates in Science and Engineering to work in areas of Materials Science, Metallurgy, Corrosion, Chemistry (water quality experiment), Electronics/Computing (microprocessor activity).

Graduates in Psychology

Graduates in Mathematics, Science or Technology with some knowledge of Dynamics.

Application Procedures

For further particulars and an application form send a postcard to the Summer School Tutors Office (SS/3), P.O. Box 62, The Open University, Milton Keynes, MK7 6AU. Completed application forms must reach the Open University by Monday 28th January 1985.

University of Cambridge

Faculty of Modern and Medieval Studies

Department of Scandinavian Studies

The Appointments Com-

mittee of the Faculty of Mod-

ern and Medieval Studies has

opened to be in a position

to appoint a Lecturer in

Scandinavian Studies.

The successful candidate

will be expected to contrib-

ute to the development of

the Department's teaching

and research programme.

The post is full time and

the salary is £11,000 per

annum. Applications should

be sent to the Director of

Staff, University of Cam-

bridge, Cambridge CB2 3RQ.

Closing date for applica-

tions: 18th January 1985.

Further details may be

obtained from the Director

of Staff, University of Cam-

bridge, Cambridge CB2 3RQ.

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bridge, Cambridge CB2 3RQ.

Closing date for applica-

tions: 18th January 1985.

LOUGHBOROUGH UNIVERSITY OF TECHNOLOGY

M.Sc. Physical
Education and
Sports Science

The Department of Physical

Education and Sports Science

invite applications for this one

year full time course due to

commence in October 1985.

The course is structured to

provide teachers, coaches and

lecturers with the opportunity

for advanced study.

Write for further details to Mr.

F.M. Holliday, Department of

Physical Education and Sports

Science, Loughborough

Leicestershire

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Universities continued

National University
of Lesotho

Fellowships

Massey University
Palmerston North,
New Zealand

POSTDOCTORAL
FELLOWSHIP
(PARASITOLOGY)

Applications are invited for a Postdoctoral Fellowship in Parasitology. The award may be made for one year and is available in the following areas: Parasitology.

A Fellowship is offered in the Department of Veterinary Pathology and Public Health to investigate factors determining the host specificity of certain *Sarcocystis* species. Applicants should have experience in cell culture, electron microscopy, immunology, or other disciplines appropriate for studying parasite-host interactions.

The emolument payable will be at a rate to be determined but not exceeding the lowest scale on the University scale for lecturers (currently NZ\$22,077 per annum).

Applicants should have completed the requirements for the award of the degree of Doctor of Philosophy.

Further details of the position, together with conditions of appointment, may be obtained from the Registrar, General Association of Commonwealth Universities (GACU), 36 Gordon Square, London WC1H 0PF, or from the Registrar, University of Wales, Cardiff, or from the Registrar, University of New South Wales, Kensington, New South Wales, Australia.

Further details of the position, together with conditions of appointment, may be obtained from the Registrar, General Association of Commonwealth Universities (GACU), 36 Gordon Square, London WC1H 0PF, or from the Registrar, University of Wales, Cardiff, or from the Registrar, University of New South Wales, Kensington, New South Wales, Australia.

Members of Congress of the University of Oxford are invited to nominate candidates for the Fellowship. Nominations, which should be accompanied by a letter of recommendation from the candidate, should reach the Secretary, Jesus College, Oxford OX1 3JH, not later than 1 January 1985.

Further details of the position, together with conditions of appointment, may be obtained from the Registrar, General Association of Commonwealth Universities (GACU), 36 Gordon Square, London WC1H 0PF, or from the Registrar, University of Wales, Cardiff, or from the Registrar, University of New South Wales, Kensington, New South Wales, Australia.

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Prifysgol Cymru
University of Wales

UNIVERSITY
FELLOWSHIPS

A limited number of Fellowships will be offered by the University in session 1985-86, available for tenure at the following constituent institutions:-

The University College of Wales, Aberystwyth.

The University College of North Wales, Bangor.

The University College, Cardiff.

The University College of Swansea.

The University College of Glamorgan, Cardiff.

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Polytechnics

NEWCASTLE UPON TYNE POLYTECHNIC

Faculty of Community & Social Studies
School of Behavioural Science

AND
Newcastle Health Authority
School of Nursing, Continuing Nurse Education & Research Unit.

LECTURER II
Burnham FE £7,548-£12,099
Ref A68/84

Applications invited from Registered Nurses who are qualified Teachers, who are also graduates with a behavioural or social science background and preferably with research experience for this innovative venture between the Polytechnic and the School of Nursing.

This will be a permanent full time appointment employed by the Polytechnic and jointly funded with the Newcastle Health Authority. The joint venture will be reviewed within 12 months of the commencement to assess its success.

You will work jointly in the School of Behavioural Science and the Department of Continuing Nurse Education, the main responsibilities will include developing and teaching the professional studies component of the BSc (Hons) Health Studies (Applied Behavioural Science) degree: planning, monitoring, lecturing and evaluating courses within the Health Authority designed to up-date staff and enhance professional development of qualified nurses.

This is an excellent opportunity to gain experience within the 2 institutions of education and foster links between them.

Informal enquiries may be made to Dr. D. W. Watson, Head of School of Behavioural Science, Newcastle Polytechnic (ext 3424).

Academic Administration Department
SENIOR ASSISTANT (ACADEMIC PLANNING)

Scale 6: £8,154-£8,712 p.a. (pay award pending)
Ref APC 63/84

The person appointed will be head of the Academic Planning Section which is concerned with administration of the Polytechnic's Academic Planning system; course approval and validation (including administration of the Polytechnic's 'Joint Validation' agreement with CNA); and subject and course review.

It is expected that you will be a graduate, or possess degree equivalent qualifications.

NUC Salary and Conditions.

Faculty of Humanities
RESEARCH ASSISTANT IN THE HISTORY OF IDEAS

Research 'A' £5,910-£6,657 p.a.
Ref RA9/84

To study the development of scientific thought in its social, political and religious context in seventeenth and early eighteenth century England. Preferred qualifications: BA in History, plus postgraduate study in History of Ideas, but other relevant qualifications considered. Registration for M.Phil. or Ph.D. will be expected, unless the applicant already has a higher degree. Duration: 2 years with possible extension to three.

For further details for the above 3 posts and application forms, returnable 20.12.84, please call our 24 hour telephone answering service (0632 325120) or write enclosing foolscap size to Mrs. Linda Morris, Admin. Asst. (Recruitment), Newcastle NE1 6ST, or when completed forms should be returned quoting ref. no. (17320)

For further details for the above 3 posts and application forms, returnable 20.12.84, please call our 24 hour telephone answering service (0632 325120) or write enclosing foolscap size to Mrs. Linda Morris, Admin. Asst. (Recruitment), Newcastle NE1 6ST, or when completed forms should be returned quoting ref. no. (17320)

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HONG KONG POLYTECHNIC

The Hong Kong Polytechnic is a large institution of advanced education which offers courses on a wide range of subjects up to vocational-oriented degree level. There are four academic divisions comprising 20 teaching departments and units, as well as two institutes. The Polytechnic invites applications for the following posts (unless stated otherwise) from September 1985:

CENTRE OF ENVIRONMENTAL STUDIES
Coordinator of the Centre. Applicants should have a record of research publications and/or experience as a consultant in at least one of the following fields: acoustics, water pollution control, air pollution control, solid waste management and environmental impact assessment.

DEPARTMENT OF ACCOUNTANCY
Principal Lecturer/Senior Lecturer in Advanced Financial Accounting, Auditing and Investigation, Taxation, and Financial Management.

DEPARTMENT OF BUILDING & SURVEYING
Senior Lecturer/Lecturer in Land & Property Law (flexible immediately).

DEPARTMENT OF BUSINESS & MANAGEMENT STUDIES
Principal Lecturer/Senior Lecturer in Management, including Organization Development, Human Relations and Personnel Practices of Management.

DEPARTMENT OF BUILDING SERVICES ENGINEERING
Principal Lecturer in Building Services Engineering. Applicants should have considerable experience in design work, preferably in both degree course teaching and consultancy practice (flexible immediately).

DEPARTMENT OF COMPUTING STUDIES
Principal Lecturer/Senior Lecturer/Lecturer in Data Communications and Networking, Computer Graphics, Social Aspects of Computing, Information Systems Analysis and Design Methodologies, Simulation, Data Base Design, Computer Aided Learning, Software Engineering, 4th Generation Programming Languages, and Computer Applications.

DEPARTMENT OF ELECTRONIC ENGINEERING
Principal Lecturer/Senior Lecturer in Application and Fabrication of Integrated Circuits, Computer Systems, Software Engineering, Control and Instrumentation, and Communication Engineering.

DEPARTMENT OF MECHANICAL & MARINE ENGINEERING
Principal Lecturer in Mechanical Engineering.

DEPARTMENT OF PRODUCTION & INDUSTRIAL ENGINEERING
Principal Lecturer/Senior Lecturer/Lecturer in Design for Manufacture, Control and Automation, Operations Management. The Department is interested in computer integrated production management, instrumentation techniques, design of production equipment and systems, CAD, CPM.

INSTITUTE OF TEXTILES & CLOTHING
Principal Lecturer/Senior Lecturer in Clothing Technology and Clothing Design/Pattern Making.

INSTITUTE OF MEDICAL & HEALTH CARE
Principal Lecturer/Senior Lecturer/Lecturer in Physiotherapy and Optometry. Senior Lecturer/Lecturer in Occupational Therapy and Diagnostic Radiography.

CENTRE OF LAND & ENGINEERING SURVEYING
Senior Lecturer in Land and Engineering Surveying. Applicants should have special interest in one or more of the following: Geodesy, Engineering Surveying and Advanced Land Engineering Surveying.

Salary and Qualifications for Appointment (£1-HK\$68.76 on 20.11.84)
Principal Lecturer/Coordinator: HK\$227,780-HK\$292,860 p.a. Candidates should have (a) a good honours degree or professional qualification and an advanced specialist qualification or extensive experience in a specialized field; (b) substantial professional experience; and (c) proven administrative ability.

Senior Lecturer: HK\$192,080-HK\$248,000 p.a. Candidates should have (a) a good honours degree or professional qualification and preferably an advanced specialist qualification; (b) substantial professional experience; and (c) proven administrative ability.

Lecturer: HK\$103,800-HK\$163,840 p.a. Candidates should have (a) a good honours degree or equivalent professional qualification but in certain disciplines, candidates with lower qualifications, such as Higher Technician level, may be considered; and (b) at least three years professional experience.

Conditions of Service: Appointment will be on two-year grant-in-aid basis. Contract terms will be subject to the Polytechnic's Staff Regulations. Benefits include long service, subsidised accommodation for overseas appointees and loan facilities on a salary of HK\$13,168 p.m. or above; medical and dental benefits; children's education allowances and a terminal gratuity of 25% of basic salary received over whole contract period.

Further information and application forms are obtainable from the Association of Commonwealth Universities (ACU), John Foster House, 36 Gordon Square, London WC1H 0PF. Completed application forms should be returned by 31 January 1985, with the fee copy sent to the General Secretary, Hong Kong Polytechnic, Hung Hom, Kowloon, Hong Kong, and the 2nd copy to the Association of Commonwealth Universities.

For further details for the above 3 posts and application forms, returnable 20.12.84, please call our 24 hour telephone answering service (0632 325120) or write enclosing foolscap size to Mrs. Linda Morris, Admin. Asst. (Recruitment), Newcastle NE1 6ST, or when completed forms should be returned quoting ref. no. (17320)

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Polytechnics continued

DIRECTOR OF
COMPUTING
CENTRE

(Senior Lecturer Level: PL equivalent)
Salary scale £12,777 - £16,104

Applications are invited for this challenging new post.

The successful candidate will be responsible for the management and product development of mainframe and microcomputer facilities, and educational computer service and related research.

Applications forms and further particulars are available from the Secretary/Treasurer at the address given below.

Closing date 14th December, 1984.

THE
QUEEN'S COLLEGE
GLASGOW
1 Park Drive, Glasgow G3 7JF
Tel. 01-334 8141.
A Scottish Central Institution.

Research and Studentships

University policy.

Overseas continued

CAPRICORNIA
INSTITUTEDEPARTMENT OF ELECTRICAL
ENGINEERING
LECTURER IN
ELECTRICAL
ENGINEERING POWER

REQUIREMENTS

Qualifications and experience in electrical power engineering. It is expected that the appointee will contribute to Bachelor of Engineering, Associate Diploma in Engineering and Masters programs.

GENERAL INFORMATION

Capricornia Institute has five schools—business, education, engineering, humanities and social sciences, and science. These schools offer bachelors degrees and a number of diplomas. Rockhampton, situated on the Tropic of Capricorn, in Queensland, Australia, is a coastal city with a population of 55,000 with easy access to the islands of the Southern Barrier Reef. Extensive capital investment and development are occurring in the region.

CONDITIONS OF EMPLOYMENT

Employment will normally be on the basis of a two or three year limited term appointment with the options by mutual agreement of converting to tenure or a renewal of the limited term appointment. Transfer and settling in expenses for appointee and family will apply.

SALARY RANGE

Lecturer III: \$A21,411 to \$A24,528
Lecturer II: \$A24,840 to \$A28,405
Lecturer I: \$A29,073 to \$A32,834

ENQUIRIES

Agent General for Queensland, P.O. Box 34, London WC2R 0LZ, Telephone (01) 3363224.

TO APPLY

Applications including a full curriculum vitae, certification of stated qualifications, and the names, addresses and telephone numbers of three referees should reach the Personnel Officer, Capricornia Institute, Rockhampton, Q. Australia 4700 by 28 December 1984.

ABOS—

A COLLEGE OF ADVANCED EDUCATION IN QUEENSLAND

European University

Antwerp, Brussels and Luxembourg
Member of the European Association of Colleges and Schools of Business

Undergraduate programs (full-time) in Business, Marketing Management, Finance, Economics, Information Systems, Accounting. The University's management services channels graduates into international, managerial positions, or graduate management programs around the world.

Graduate programs (part or full-time): Master's of Business Administration, International Management or Information Systems. Above, the placement services facilitates employment, but also, uniquely offers graduates the opportunity of obtaining a second master's degree at a top U.S. university in as little as 8 months.

For information contact:
The Admissions Office
European University
Antwerp 121-125
2000 Antwerp / Belgium
Tel: 03208.10.77
03216.81.52
Campus locations:
Jacob Jordaensstraat 78-79
2018 Antwerp / Belgium
Rue Royale 302
1030 Brussels / Belgium
New Luxembourg campus to be announced.

Faculty Position
Comparative Literature
September 1985

Position beginning September 1985 at rank of Full Professor. Senior Comparative Literature scholar, broad and deep teaching experience required, field open beyond Renaissance. Send CV and concise letter describing intellectual stance via e-mail to: Prof. Anne Balaban, Chair, Department of Comparative Literature, New York University, 19 University Place, New York City, New York 10003, U.S.A., for consideration of the Search Committee.

NEW YORK
UNIVERSITYChallenging
Posts
Overseas

Applications are invited from suitably qualified persons, regardless of sex, race, colour or national origin for appointment to the following posts at the University of the Witwatersrand in Johannesburg.

DEPARTMENT OF CIVIL
ENGINEERING
Chair of Project and Construction
Management

Applicants to the Chair of Project and Construction Management in the Department of Civil Engineering should possess a suitable postgraduate qualification and have spent a number of years in practice in Project and Construction Management.

The successful applicant will require expertise within the field of Project and/or Construction Management • be responsible for: developing of specialised courses offered by the Department of Civil Engineering mainly at postgraduate level, in this field • retaining close liaison with the Building and Construction Industries • developing a range of continuing education programmes. Submit applications by 31st January 1985.

CHAIR OF ARCHITECTURE

Applications are invited for appointment to the vacant Chair of Architecture, which is one of two Chairs in the Department of Architecture. The incumbent of the Chair may in due course be appointed Head of Department. The appointee will have opportunities for teaching and research in his field of interest and will have departmental administrative responsibilities. Submit applications by 1st March 1985.

The Department offers Bachelor's, Master's and Doctoral degrees and will be instituting a Master of Architecture (with specialisation in Conservation) course in the near future. The Department is jointly responsible for instruction in the Master of Environmental Planning (Urban Design) course.

GRADUATE SCHOOL OF BUSINESS
ADMINISTRATION
Chair of Business Administration
(Human Resources Management)

Applications are invited for appointment to the Chair of Business Administration in the field of Human Resources. The Graduate School of Business Administration is situated on a self-contained campus in the heart of Johannesburg which is a large cosmopolitan city and financial centre of South Africa.

The Professor of Human Resources will be involved in: the organisation and teaching of courses on the MBA, PhD, Post-Graduate Personnel Management and Executive Development Programmes, and participation in research supervision.

Ideally, applicants should have: a doctoral degree and/or evidence of scholarship in his/her discipline. Teaching, and research experience in two or more of the following fields: organisational behaviour, organisation design and development, personnel management, human resources planning, industrial and management training and industrial relations. Appropriate experience in private or public organisations. Knowledge of the unique Human Resources situations in South Africa would be an added recommendation. Submit applications by 11th January 1985.

MECHANICAL ENGINEERING
Senior Lecturer - Applied Mechanics

The successful applicant for Senior Lecturer in Applied Mechanics should have qualifications and experience in one or more of the following areas: Statistics and Dynamics of solids and machines; vibrations and control; stress analysis; use of finite element method.

Duties: undergraduate and postgraduate lectures • tutorials • laboratory classes • supervision of research work. A limited amount of consulting work is permitted.

The School has well equipped workshops and excellent laboratory facilities in various fields. A Science Park is now being developed. Submit applications by 15th January 1985.

Academic salaries are under review. Details are obtainable on request.

Benefits will include: inter alia: • pension • medical aid • annual bonus • generous leave privileges • remission of tuition fees for dependants attending the University • housing subsidy (if eligible) • removal, travel and settling-in allowances may be payable.

For a detailed information sheet contact Mr Geoff Henning, South African Universities Office, Chichester House, 278 High Holborn, London WC1V 7HE.

UNIVERSITY OF
THE WITWATERSRAND

UNIVERSITY OF CAPE TOWN

Vacancies

ASSISTANT LECTURER

The Department of Romance Studies (Italian) has a vacancy for an assistant lecturer from 1 July 1985. Applicants should possess good academic qualifications in Italian and be equipped to teach both the language and a fair range of Italian literature. A special interest in language teaching and/or in twentieth century literature may be a recommendation. Salary range: R13 383-R19 377 per annum. Apply to the Registrar (Attention: Appointments Office, E/41123) by 6 January 1985.

DEPUTY DIRECTOR

The University Libraries have a vacancy for a Deputy Director who will be responsible to the University Librarian for the direction and supervision of the operations and administration of the divisional, branch and reading room units of the Library System and all other internal and external public service activities. Applicants must possess graduate library qualifications and should preferably be professional members of the South African Institute of Librarianship and Information Science. Substantial professional experience in a research library including senior level supervisory and administrative experience is required. Salary range: R2 465-R3 077 net month. Apply to the Registrar (Attention: Appointments Office, E/41123) by 31 January 1985.

Applicants should submit a full curriculum vitae and the names and addresses of three referees to the relevant section, University of Cape Town, Private Bag, Rondebosch, 7700, South Africa. Further information may be obtained from the Registrar or the Secretary, SA Universities Office, Chichester House, 278 High Holborn, London WC1V 7HE.

The University's policy is not to discriminate on the grounds of sex, race or religion. Further information on the implementation of this policy is obtainable on request.

Staff benefits include an annual bonus of nearly one month's salary and attractive staff benefits.

FSR 0773

DARWIN COMMUNITY COLLEGE

ADVANCED EDUCATION OPPORTUNITY
SCHOOL OF GENERAL STUDIES
DEPARTMENT OF HUMANITIES &
SOCIAL SCIENCESPRINCIPAL LECTURER IN
ANTHROPOLOGY
POSITION NO: GS37

Salary: \$A40628 p.a.

The Department offers a Bachelor of Arts programme which includes major sequences in anthropology, English, history, politics, psychology and sociology. At present, anthropology offers units in the B.A. and in other advanced education courses in introductory and advanced social anthropology, tribal society, complex society, social and cultural transformations, development and underdevelopment, ritual and religion, and the ethnographies of Aboriginal Australia, and Pacific and South and Southeast Asia.

The Department invites applications for the position of Principal Lecturer. The successful applicant will be expected to offer academic leadership in the discipline and have a demonstrated capacity to teach a broad range of topics. Applications will be considered from sociocultural anthropologists with expertise in any theoretical or ethnographic approach, although preference may be given to a specialist in Australian studies.

Qualifications: Applicants should have a higher degree and a record of research and substantial publications in the discipline.

For further information on the duties of this position please contact Dr. O. R. Davidson, Head of Department, Humanities & Social Sciences, phone: (089) 644277.

Conditions of Service: In addition to salary a district allowance of \$A2080 P.A. (with dependants of \$A1176 P.A. (without dependants) is also payable. A copy of the college's conditions of service, together with an information statement on the above position and the Department, will be forwarded on receipt of applications. The applicant will be expected to take up duty in July 1985.

Application forms can be obtained from:

The Senior Personnel Officer
Darwin Community College
P.O. Box 40148
Cairns, NT 6852
Australia
or by telephoning (089) 264484.

Closing Date: 18 February 1985

(1784)

CONCORDIA UNIVERSITY

Management Information Systems

Concordia invites applications from qualified individuals for its expanding undergraduate, graduate and executive development programmes in management information systems. Rank and salary are open. Qualification to Ph.D. level, or near completion is required with evidence of effective teaching. As a large progressive university in the heart of a cosmopolitan city, and located close to the United States, Concordia offers excellent opportunities for MIS research, consulting and teaching. Preference is given to candidates eligible to work in Canada. Applicants should write with curriculum vitae and the names of 3 referees, or call by Thursday, December 20th 1984.

Dr Ronald McTear
Chairman, Department of Quantitative Methods,
Faculty of Commerce and Administration,
Concordia University
1455 De Maisonneuve Blvd. West
Montreal, Quebec, Canada H3G 1M8
(514) 879-7210 or 878-4366

Interviewing will be conducted in London and Glasgow in late December and early January.

(1785)

Overseas continued

ANGLO-SPANISH JOINT
RESEARCH PROGRAMME IN
HIGHER EDUCATION
(ACCIONES INTEGRADAS)

The British Council invites applications in all academic disciplines for inclusion in the 1985/86 programme (1 June 1985-31 March 1986). The scheme was established in 1983 with the Spanish Ministry of Education and Science in order to promote the interchange of research experience between universities and polytechnics in both countries through the award of travel and subsistence grants for joint research projects (Acciones Integradas). Applicants must already have identified a Spanish project partner who should respond simultaneously to the current announcement being made in Spain by the Spanish Ministry of Education and Science. Projects which were awarded grants in 1984/85 must reapply if they wish to be considered for further funding.

Application forms and further information on the scheme may be obtained from:

Higher Education Division (Acciones Integradas)
The British Council
10 Spring Gardens
LONDON SW1A 2BN
Telephone 01-930 8466 (extension 2524)

The deadline for the return of completed forms is Friday 22 February 1985.

The British Council

The University of Central Florida
Charles N. Millican
Endowed Chair in
Computer Science

The chair, one of the first of its kind in the Southeast has been established with an initial funding of \$1,000,000. The Search Committee is accepting applications and nominations for a person who is a leader in Computer Science. We desire an individual with an established and continuing record of research excellence in one of the core areas of Computer Science. Areas which are a particular interest include Architecture (especially VLSI design), Programming Systems (languages, tools and environments), Artificial Intelligence (especially expert systems), Data Bases, and Algorithm Design and Analysis.

Computer Science at the University of Central Florida is a comprehensive program. We offer programs leading to the PhD, MS and BS degrees. Our departmental research facilities include a VAX 11/780, a VAX 11/730, a PDP 11/44, a microprocessor laboratory, and a VLSI design laboratory. We expect the holder of this chair to help us move rapidly in the further development of our research and graduate degree programs. We are looking for an individual who interacts well with others and is willing to guide the research efforts of both students and junior faculty members. We offer an excellent salary opportunity and a great deal of freedom to pursue research goals. We also offer a superb, unspoiled environment in which to live. Orlando itself has over 1,000 beautiful lakes, with the Atlantic Ocean less than 45 minutes away.

Salary, term and length of appointment are open. The starting date is also negotiable, with the most desirable time being mid-August of 1985.

Applications and nominations will be accepted until March 1, 1985. Please send these to:

Endowed Chair in Computer Science
Computer Science Department
University of Central Florida
P.O. Box 26000
Orlando, FL 32816

The University of Central Florida is an Equal Opportunity/Affirmative Action Employer.

(1786)

COLUMBIA
UNIVERSITYPolitical
Theory

Senior professor at the tenure level in political theory. The candidate must have a record of distinguished scholarship. Appointment could begin either September 1985 or September 1986. Teaching responsibilities will be undergraduate as well as graduate. Applications and supporting materials should be sent to: Douglas A. Chalmers, Chair, Department of Political Science, Columbia University, New York, New York, 10027. Equal Opportunity/Affirmative Action Employer.

(1785)

Queensland
Agricultural College
(A multi-purpose College of
Advanced Education)

INSTRUCTOR
IN RESTAURANT
OPERATIONS
(2 POSITIONS)

(1) INSTRUCTOR
IN FOOD
PREPARATION
AND PRODUCTION
(1 POSITION)

(Tenured Positions)

DUTIES:

The appointees will be responsible to the Head, Department of Food Studies for:

(a) instruction in the efficient development, preparation, conduct, technique and reporting of - (i) restaurant operations, or (ii) food preparation and production operations, as part of the educational program;

(b) assessment of the progress of students;

(c) contribution to curriculum and course development in the areas of food, service, operations or food preparation and production respectively.

QUALIFICATIONS:

(a) Appropriate academic or technical qualifications;

(b) Relevant professional/ supervisory experience in commercial operations specialising in either - (i) food and beverage service, or (ii) food preparation and production.

SALARY: Salary, according to qualifications and experience, will be in the range of \$A18,769 - \$A26,718 per annum.

Applications, containing full personal particulars, details of qualifications and experience and the names of two referees should be forwarded to the Office of the Academic Registrar for Queensland Universities, 111 St. John's Lane, London WC2N 2DB.

(1786)

General Vacancies

Four Outstanding
Sales Opportunities in the
Educational SectorHigh-technology products
London-based

This much acclaimed, international US corporation markets a pioneering and innovative range of business machines that set the standards for others to follow.

Sales Manager: c. £30,000 + car + benefits

You will lead, motivate, and co-ordinate the activities of a small, dedicated team identifying and closing sales, to ensure volume and revenue targets are achieved. An enthusiastic

Corporate plans for growth call for the appointment of four key professionals with the expertise and experience needed to develop business with educational and research institutions.

and entrepreneurial approach to business development must be matched by well-developed interpersonal skills. Age range 28-45. Ref: SS73/0338/T.

Three Sales Executives: c. £25,000 + car + benefits

Hungry for results and motivated by success, you will negotiate with key decision makers in this sector and use your expertise to win the order. Age range 25-35. Ref: SS73/0338/T.

right motivation and sales ability - albeit latent - will also be considered.

Highly attractive remuneration packages will be negotiated for high-calibre candidates.

Please send cv, or telephone or write for an application form, quoting the appropriate reference, to Stephen Newman.

PA

PA Personnel Services

PA Sales Selection, Hyde Park House, 60a Knightsbridge, London SW1X 7LZ. Tel: 01-235 0650 Telex: 21874.

PLEASE MENTION THE
THE
WHEN REPLYING TO
ADVERTISEMENTS

General Vacancies continued

ECONOMIC AND
SOCIAL RESEARCH COUNCIL
(previously Social Science
Research Council)SECRETARY TO
THE COUNCIL

The Council is seeking a successor to the current Secretary of the Council who retires at the end of July 1985. The Secretary is the Council's senior permanent officer and deputises for the Chairman as needed. His or her main duties are concerned with the management of Council's resources - staff, cash and information. (The Council spends over £23 million each year on research in universities and other research institutions, on the training of postgraduate students, and on over 20 research centres located in universities or independent institutes throughout the UK). The post involves an important contribution to policy making and maintaining good working relations with government departments and other public bodies.

The successful applicant should have a proven record in the management of an organisation in higher education, research, or a relevant public or private sector body.

The Council invites applications for the post. Further details and application forms can be obtained from the Establishment Officer, ESRC, 1 Temple Avenue, London EC4V 0BD (telephone: 01-353 5252).

The salary will be in the range £21,313 to £25,817; and other conditions will be analogous with the Civil Service. Applications must be returned to ESRC not later than Wednesday, 18th January, 1985.

The ESRC is an Equal Opportunity Employer.

E/S/R/C

(1783)

HOUSE OF COMMONS
(Department of the Clerk of the House)
SELECT COMMITTEE
SPECIALIST ASSISTANTS

Special Assistants are required for (a) Select Committee on Environment and (b) Select Committee on Education, Science and Arts. The duties will include giving assistance to the Clerk of the Committee and undertaking research into specific questions. Applications are invited from candidates with a good degree or an equivalent professional qualification in a relevant subject together with several years' relevant practical experience which in the case of post (b) should include experience of educational administration. An interest in public administration would be an advantage.

The preferred age range is 28-35 years and for a successful candidate within this range will be between £11,762 and £14,444 pa according to age, qualifications and experience. Applications from particularly well qualified candidates aged from 25-27 will also be considered. The salary for this age group will be between £9,783 to £12,028 pa. There is a non-contributory pension scheme with interchange arrangements with other Public Service pension schemes. The appointments will commence as soon as possible after 1 January 1985 (post (a)) and 1 March 1985 (post (b)) and will be for a period of between two and four years.

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For further details and application form write to the Establishments Office, HOUSE OF COMMONS, LONDON SW1A 0AA, or telephone 01-219 5544 (answering service) quoting reference number - 2A/44, (for Environment Committee); 2A/45, (for Education, Science and Arts Committee).

Closing date for receipt of application forms: 31 December 1984.

The House of Commons Service is an Equal Opportunity Employer.

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Research

COGNITIVE SCIENCE AND
INFORMATION TECHNOLOGY

The Education and Human Development Committee of the Economic and Social Research Council invites proposals in the following areas related to its programme of work in Cognitive Science and Information Technology:

- i. proposals for fundamental research on the dynamics of development and communication in cognitive systems;
- ii. proposals for research related activity and study visits aimed at research staff development in the cognitive science aspects of advanced information technology and/or its application to education.

Further details are available from:
Martin Kerder, Economic and Social Research Council,
1 Temple Avenue, London EC4V 0BD.

E/S/R/C

(1780)

inside

The MINERS' STRIKE is now in its ninth month and shows little sign of resolution. Increasingly, academics are being drafted in to consider some of the wider issues and practical dilemmas being raised by the dispute. Paul Flather looks at a fascinating example of "instant history" ... (page 12)

... at the same time, emphasis is shifting to the problem of STRIKE-BREAKING. Geoffrey Alderman considers an aspect of trade union history which is most often passed over in embarrassed silence (page 17)



Robert Maxwell: the saviour of Ethiopia? The Conservative Government is openly committed to private enterprise; how does this affect our commitment to FOREIGN AID? Stephen Chan examines an issue that is dividing the Conservative Party (page 18)

"Hitler is my best friend. He shakes the tree and I collect the apples." America quickly became the beneficiary of an influx of political refugees in the 1930s. The balance of intellectual power tilted dramatically. David J. Levy reviews Lewis Coser's new study of the REFUGEE SCHOLARS (page 20)

Programming, graphics, text processing, optimization and the myth of the learning machine. Six pages of COMPUTER SCIENCE books (pages 24-29)

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Christopher Thomas on Neville Chamberlain
Four pages of the Scottish 'great debate'

... and more...
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U and non-U

The future of higher education in Britain, we are told, lies with mature students, part-timers, continuing education. In the narrow debate about the future size of the system it is on growth in these areas which the optimists rely in the struggle to convince the pessimists, and of course the Government, that higher education will beat demographic decline in the 1990s. In the broader debate about the future ethos of the system as strong a trust is placed in the same groups: the National Advisory Body's explicit claim that the polytechnics and colleges can reach those parts (of society) that the universities cannot reach is grounded in that trust, while both the NAB and the University Grants Committee in their common chapter on higher education and the needs of society in their respective advice to Sir Keith Joseph implicitly assert the same faith and the same priority.

So much for the future. The present of higher education seems to belong more firmly than ever to the 18-year-old school-leaver with good A level grades wishing to study full-time for an honours degree. Those who rock the boat by enrolling too many "non-standard" students, like the sociology and applied social studies departments in the Polytechnic of North London, invite punitive visits from the HMI *pour encourager les autres*, while university departments vie with each other to cut off their own "long tails of low achievers" and raise the average A level grade point average of their students to please the UGC. Since the 1981 cuts this retreat to the "safety" of traditional standards has become a rout despite the rhetoric of advance so strongly articulated by the NAB and acquiesced in by the UGC.

Such schizophrenia, hypocrisy maybe, is not new. Fifteen hundred years ago St Augustine wrote in his *Confessions*: "Give me chastity and continence - but not yet." But it is nevertheless alarming to see such a gap between the rhetoric of the future and the practice of the present. Last weekend's conference at PNL on the learning needs of non-traditional students attempted to explore this phenomenon.

The HMI report on the two PNL departments is a good starting point, however negative its immediate impact. First, it does raise many key issues, student selection and assessment, teaching styles and course structure, which British higher education will have to tackle seriously as it cranks an increasing number of non-traditional students. Second, the HMI report so clearly reveals the blinkered hierarchy that discriminates in favour of univer-

sities and against polytechnics, in favour of higher and against further education, in favour of full-time and against part-time students, in favour of safe A level candidates and against those with more diffuse but maybe more useful qualifications.

This hierarchy, of course, is constantly reinforced by the use of terms like traditional and non-traditional. So their use must be as constantly checked against the shifting reality of contemporary higher education. For if traditional students are defined as 18-year-olds with A levels enrolling on full-time honours degrees, a substantial and growing minority of students does not possess at least one of these characteristics. There are almost 300,000 part-time students compared with just over half a million on full-time and sandwich courses; a third of non-university students are mature and even in the universities the total is almost 10 per cent; 40 per cent of polytechnic and college students are not studying for degrees; 10,000 of the 70,000 students admitted to universities last year did not have A levels or Scottish Highers and in the non-university sector the proportion was even higher; even on the narrower test of non-standard entry about one in 20 students on Council for National Academic Awards degrees falls into this category.

Two conclusions can be drawn from this surprising picture. First, there are many students in higher education who are in some sense non-traditional. So it makes little sense to treat these students as an exception, an aberration, on the fringe; they should be seen as having a central and secure place in our system. Second, all these different groups of non-traditional students have problems, and of course assets, in common. They should not be picked off singly and labelled as isolated problems. We should challenge the discriminatory categories that divide higher education into U and non-U students - especially when the latter is a large and growing component of the whole.

Non-traditional students should not be regarded as a group, or even groups, apart from the traditional core of students. Of course they face and create difficulties. Because of the cut-back in student places they are being squeezed out by students with A levels who seem a safer (politically as much as academically) bet. For their part institutions have too little experience in assessing the potential of students without the standard entry qualifications and whose often valuable and relevant experience has left no bits of paper behind. Quality is important but

so is flexibility. Maybe universities and polytechnics need to go in for some experiential learning of their own.

Non-traditional students certainly have weaknesses. They may lack effective study skills and have gaps in specialized knowledge that loom especially (and unnecessarily?) large in science and technology. But they may also have great strengths - a more mature motivation than adolescents arriving at the top of the A level escalator, more street-wise knowledge of the practical world that may be especially relevant in professional and even some technological subjects, and a commitment to learning that may upset the conventional balance of spoon-feeding and deference that satisfies too many school-leavers. In the polytechnics and colleges which run parallel full-time and part-time degrees students on the latter often make a much more stimulating and sophisticated contribution. So it can be with non-traditional students.

The message is simple. Non-traditional students may need help but they also help. They are not academic cripples. Any intellectual insecurity they suffer may be more than compensated for by other forms of maturity. Nor is it sensible to overemphasize the demands such students make on counselling services. Not all of them get divorced or evicted. In short non-traditional students should not be regarded as a "problem"; to do so is to acquiesce in the disabling and elitist categories that are the real problem.

Far from being a problem the presence of such students can often present higher education with an opportunity. It can help to shake up our present complacency and oppressively narrow system of higher education, by encouraging universities, polytechnics and colleges to re-examine the needs of all their students in a new light. But more important by thinking seriously about the issues provoked by the presence of non-traditional students we will also begin to think seriously about what in practice would be involved in the construction of the brave new future of continuing education, of a higher education that did genuinely reach the parts our present system fails to reach. For the difficulties faced by a 45-year-old manager returning to higher education on a short course, or of an engineer on an updating course, are very similar to those of the mature students without A levels. Both in different ways are non-traditional students. So in talking of non-traditional students we are not considering an awkward and uncomfortable problem at the margin but confronting head-on the future of all higher education.

Militant middle class

Nine months of a miners' strike that has provoked the worst industrial violence in Britain for more than 60 years have left Mrs Thatcher's Government not only unbowed but unmoved. Nine days of growing protest about Sir Keith Joseph's decision to make rich parents contribute more to the cost of the higher education of their children have already provoked a jittery U-turn. It is both an impressive and a depressing spectacle: the militant middle class in defence of its perks (mixed in with some good old 1960s-style student demerol (the short form is mist. euphonic of the phenomenon)).

Letters of protest from deep in the home counties are gradually spreading across the pages of *The Times*. One hundred and thirty Conservative MPs have signed motions opposing Sir Keith's decision. Even the *Daily Mirror* has devoted a leader to the subject, even if the conclusion was that the Conservative middle classes had finally got what they voted for.

redistributed within the system, away from student support and into scientific research. If the source of the protest is accumulated distress at the treatment of higher education, it seems a strange time for it to explode.

No, the real reason is that higher education has become embedded in the expectations of the middle class. Many parents expect that, given reasonable motivation and adequate ability, their children should find places somewhere in higher education. More important, they expect that these places should be available at minimum personal cost to themselves. After all, some have been paying school fees for maybe a decade and look for some relief of the financial burden when their children enter higher education. So it is a kind of higher education constituency - but not one that can be exploited by higher education itself.

But the controversy is depressing for a number of reasons. Most immediately, it has destabilized the present pattern of student support. Only the most optimistic (and the most naive?) will believe that the outcome will be a reinforcement of the system of student grants established in 1962. The amounts that rich parents, the principle of the present system, are now being asked to contribute are well regarded as a small price to pay for the security

attractions of cheap loans. By accident or design Sir Keith has put loans back on the active agenda.

There is now a real danger that the case for loans will grow by a kind of informal osmosis as the present system of grants crumbles. Those who object to loans, the left in general and the National Union of Students in particular, must recognize the seriousness of this challenge. Kicking the Government when it is half down will prove to be only a temporary delight. The real effort must be channelled into building a credible and coherent alternative to loans, which can only come from a much closer integration of student support and the tax and social security systems and a comprehensive review of the needs of all students from Manpower Services Commission trainees to adult learners.

But the embarrassment of Sir Keith by the backbench rebellion is depressing for a more profound reason. For the fact demonstrates that the strength of higher education's constituency depends almost entirely on its privileged social base. It locates it decisively in what the Bishop of Liverpool has called comfortable Britain. Outside in that other Britain of mass unemployment and shrunken opportunity there are more desperate needs and more urgent injustices. But they all go unmentioned in backbench revolts, and are forgotten by 20 years.



Fifth Column

I noticed a small column in the press a few weeks ago that men in Moscow are scouring the shops for trousers with zip fasteners and are having little luck because the manufacturers in that backward country are still producing trousers with fly buttons. That must mean that all the funny jokes about fly buttons will have in future to be told about Russians - who are not particularly funny, especially in Moscow. I once stopped there for a few hours at the airport and have never seen such miserable looking citizens.

It happens that I know quite a lot about fly buttons. I spent two years in hospital in my early teens, an orthopaedic hospital in which patients able to walk were sent to work in either the splint shop, the bootmakers' or the tailors'. I opted for the tailors' and spent a year helping to make those bright blue suits that wounded servicemen wore during the war.

The man in charge of the shop told me that I must have been born with a thimble in my mouth. Even with a calliper on one leg I managed to work the treadle sewing machine - at considerable speed - and was soon put on to making trousers.

I have of course to keep this skill quiet nowadays or there would be no end to the tasks that would be entrusted to me especially in a polytechnic that teaches home economics. My family believes that I cannot do anything useful in the house, I am glad to say, though my wife still comes to me to thread a needle if she cannot get the cotton through the eye.

I was particularly good at making turn-ups, in those old, old days when such useless features were popular. But what really filled me with pride was my skill with buttonholes.

To anyone who has never made a buttonhole it is difficult to communicate the excitement and satisfaction in making a good one. Whatever happens nowadays you had at that time to punch a hole not too close to the edge of the material and then cut a slit just long enough to accommodate the button.

A crucial item was the twist of thread that was stitched around the hole to keep it firm and prevent it from curling up, and then came the small neat knotted stitches that formed the lips of the final product. I remember being particularly careful with the buttonholes on a suit for one of the consultants, a Scotswoman of notoriously economical habits who wanted his suit turned so that it would last for another 20 years.

I recognize that such a valuable skill is now quite useless. Buttonholes are made by machine. And there are less of them. No longer can one play such hilarious jokes as sewing up the fly buttonholes so neatly that the stitching is invisible, and then listening to the expressions of puzzlement, frustration and growing anger as a man struggles to fasten them.

What announced the end of the fly button was the zip fastener. I discovered to my surprise that it is not even mentioned in most encyclopaedias and does not feature in any of the histories of industrial design that I have collected. Perhaps it is taken so much for granted that authors think it simply happened.

In fact it is a very brilliant piece of design that has affected all sorts of products as well as clothing. In turn it is giving way to Velcro and its derivatives. Soon its making will only be seen in folk museums. I shall watch and criticize.

Patrick Nuttgens